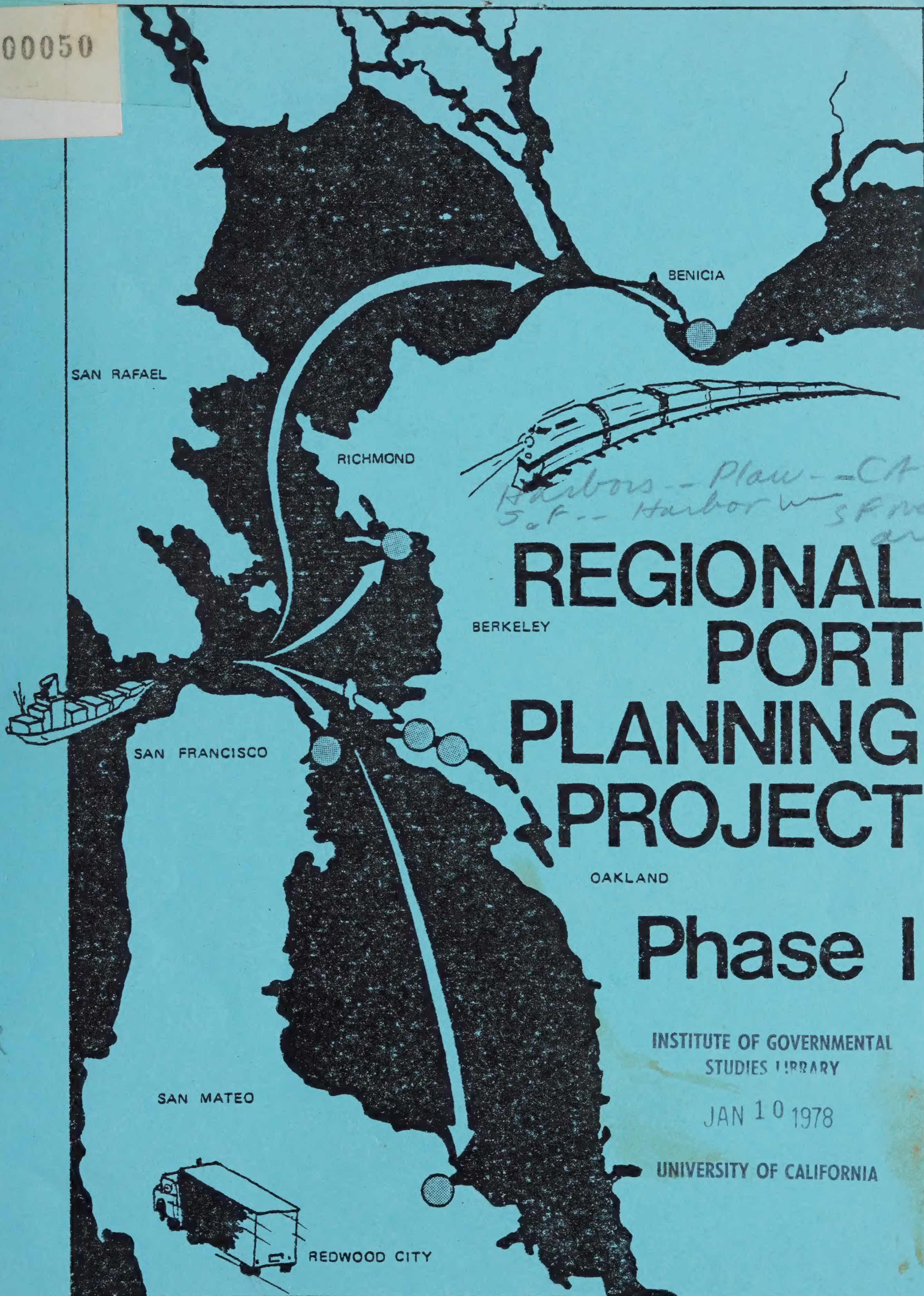

Harbors--Plan--CA--
S.F.--Harbor-- SF metro area

REGIONAL PORT PLANNING PROJECT

Phase I

Metropolitan Transportation Commission

METROPOLITAN TRANSPORTATION COMMISSION

The Metropolitan Transportation Commission (MTC) was created by the California Legislature in 1970 to provde comprehensive regional transportation planning and financial programming for the nine-county San Francisco Bay Region.

MTC has 16 voting members appointed by local and regional governmental agencies throughout the Region. There are three non-voting members who provide policy ties to State and Federal Agencies, i.e., California Department of Transportation, U.S. Department of Transportation, and U.S. Housing and Urban Development. (HUD has not appointed a representative to MTC to date.)

MTC is designated by the Governor as the metropolitan planning organization (MPO) for the Bay Region. Because of this and other state and federal requirements, MTC has legally defined responsibilities including:

- transportation planning
- financial planning and programming of federal and state capital and operating funds for all modes of transportation
- implementation through the allocation of funds
- regulatory and pricing policy setting for state-owned bridges

MTC works jointly with other regional agencies such as the Association of Bay Area Governments (ABAG), the Bay Area Air Pollution Control District (BAAPCD), and the Bay Conservation and Development Commission (BCDC), and state agencies like the Department of Transportation. MTC's Regional Transportation Plan is consistent with ABAG's Comprehensive Regional Plan. It considers not only transportation, but also environmental, economic, and social needs of the Bay Region.

M900050

Metropolitan Transportation Commission

October 26, 1977

Dear Reader:

The Phase I Report and the shorter Public Information Summary have been prepared as part of the Metropolitan Transportation Commission's (MTC) three-phase regional port planning project for the San Francisco Bay Area. This planning project will provide a maritime element to MTC's Regional Transportation Plan as required by law, provide a basis for updating the port element of the Bay Conservation and Development Commission's (BCDC) Bay Plan, and provide a comprehensive and coordinated guide to future port development in the Bay Area. The MTC has created the Regional Seaport Policy Committee to oversee development of this plan and to advise it on maritime matters. The Committee represents a broad spectrum of government and port industry representatives with members from MTC, BCDC, the Association of Bay Area Governments, the California Department of Transportation, the U.S. Army Corps of Engineers, the U.S. Maritime Administration, and the six Bay Area ports.

The MTC Regional Seaport Policy Committee has identified the following purposes for the regional port plan:

1. Ensure the continuation of the San Francisco Bay port system as a major world port and contributor to the economic vitality of the San Francisco Bay Region.

2. Maintain or improve the environmental quality of San Francisco Bay and its environs.

3. Provide for the efficient use of finite physical and fiscal resources consumed in developing and operating marine terminals.

4. Provide for the integrated and improved surface transportation facilities between San Francisco Bay ports and terminals, and other regional transportation systems.

HOTEL CLAREMONT • BERKELEY, CALIFORNIA 94705 • (415) 849-3223

The scope of work for each of the three phases is:

Phase I - Establish present capacity of San Francisco Bay marine terminal facilities, establish forecasts of waterborne commerce, identify factors effecting future port needs for the years 1985 and 2000, and identify San Francisco Bay shoreline sites which have potential for handling these needs. An analysis of petroleum terminals and other proprietary facilities is not included in this phase.

Phase II - Identify bay shoreline areas which are feasible for future marine terminal use and conduct regional and port specific impact assessments of marine terminal development at these sites. Analyze petroleum handling facilities and other proprietary marine terminal facilities. Analyze factors affecting future port needs and develop preliminary project review criteria.

Phase III - Develop regional port plan and prepare maritime element for the MTC's Regional Transportation Plan (RTP).

Thus, the Phase I Report (or the Public Information Summary) accompanying this transmittal letter is an interim report in a continuing planning effort designed to develop a regional port plan.

As conceived, this regional port planning program is a multi-agency effort with MTC and other agencies contributing both staff and financial resources. The Phase I analysis has been conducted by a consultant under the management of MTC and BCDC. The accompanying document is the report of our consultants, Gruen Gruen & Associates and Manalytics, Inc.

Written comments received from members of the Regional Seaport Policy Committee regarding the consultant report are attached as Exhibit A. In summary the comments are as follows:

- Both the forecasts and capacity estimates are acceptable with the understanding that, although they are not strictly consistent with U.S. Army Corps of Engineers' estimates, they are close enough for planning purposes and that MTC staff will continue to coordinate with the Corps.

- Sufficient information has not been developed during the analysis of shortfall methodology to prepare quantitative estimates of the factors identified as impacting the computation of shortfall.

- NORCAL does not agree that the criterion which is based on accessibility to deepwater provides a realistic basis for selecting potential port sites.

- The North Harbor site at the Port of Oakland should be added to the list of 63 sites to be carried forward into Phase II and that other sites may be proposed.

- BCDC generally accepts the analysis and results of Phase I and believes that Phase I provides a sound basis for further study.

At its meeting on October 18, 1977, the Regional Seaport Policy Committee adopted the following elements of the Phase I Report:

- Chapter I, Introduction

- Chapter II and III describing the capacity estimates and forecasts, respectively

- Chapter IV, Methodology for Identifying Shortfalls, subject to the understanding that attempts during Phase I to quantify the factors effecting the shortfall computation are not conclusive and that further study will be required in Phase II to analyze the identified factors and to evaluate the concepts.

- The 63 sites identified in Chapter V together with the North Harbor site of the Port of Oakland and submerged lands belonging to the United States adjacent to the Oakland Army Base to be carried forward into Phase II; other sites which may have been ruled out by the deepwater access criteria and which are proposed for study during Phase II, will be considered for study on a case-by-case basis by the Committee based on the overall economic and environmental factors involved.

- Data developed to evaluate the potential of each site for future marine terminal development to be supplemented by additional data developed during Phase II.

- The appendices to the Phase I Report.

For general distribution, the Committee has also approved use of the Public Information Summary in lieu of the complete Phase I Report.

Copies of Volume A of the appendix containing the interim reports on the forecasts and capacity estimates can be obtained at MTC offices in the Hotel Claremont, Berkeley, California. Volume B of the appendix containing the data on the site inventory and analysis is available for inspection at MTC's offices or BCDC's offices in San Francisco.

If you have any questions regarding this report, please contact MTC's public information office.

Very truly yours,

A. W. Gatov
Chairman
MTC Regional Seaport Policy Committee

DF/ck

MTC REGIONAL SEAPORT POLICY COMMITTEE

Member/Alternate	Representing
A.W. Gatov (Chairman)	Metropolitan Transportation Commission
Quentin Kopp	Metropolitan Transportation Commission
Anne Diament	Association of Bay Area Governments*
Joseph C. Houghteling/ Col. Charles R. Roberts	Bay Conservation and Development Commission
Beth Osborn/Stanley Euston	Bay Conservation and Development Commission
M.E. Hardin/Cecil Smith	California Department of Transportation
Col. John M. Adsit/Hugh Converse	U.S. Army Corps of Engineers
T.J. Patterson, Jr./Jack Knecht	U.S. Maritime Administration
George B. Plant/Joseph Dudziak	Port of Benicia
Joseph E. Delsol (Vice-Chairman)	Encinal Terminals
Walter A. Abernathy/Gerald Pope	Port of Oakland
L. Meek Mauk/Fred DiPietro	Port of Redwood City
Stanley Grydyk/Capt. Thomas R. Eddy	Port of Richmond
Thomas Soules	Port of San Francisco

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Stanley R. Euston	BCDC
Jack Knecht**	U.S. Maritime Administration
Cecil Smith	CalTrans
Hugh Converse	U.S. Army Corps of Engineers
Frank Boerger	Consultant, NORCAL

*ABAG may designate two members to the Committee; the second appointment is currently vacant.

**Before joining the U.S. Maritime Adminstration, Mr. Knecht was MTC's project manager for the regional port planning project.

MTC REGIONAL PORT PLANNING PROJECT

PHASE I REPORT

TO

THE METROPOLITAN TRANSPORTATION COMMISSION

AND

THE BAY CONSERVATION AND DEVELOPMENT COMMISSION

OF THE

SAN FRANCISCO BAY AREA

PREPARED BY

GRUEN GRUEN + ASSOCIATES
AND
MANALYTICS, INC.

JUNE, 1977

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TABLE OF CONTENTS

	PAGE
CHAPTER I - INTRODUCTION	I-1
PURPOSE AND APPROACH OF PHASE I, REGIONAL PORT PLANNING PROJECT	I-1
PHASE I, STUDY DESIGN	I-2
CONTENTS OF FINAL REPORT AND TECHNICAL APPENDICES	I-5
CHAPTER II - EXISTING PORTS AND CAPACITIES	II-1
SAN FRANCISCO BAY AREA PORTS	II-1
METHODOLOGY FOR ESTIMATING TERMINAL CAPACITY	II-3
Comparison of Methodologies	II-3
Concept of Practical Capacity	II-3
Methodology for Estimation of New or Modified Terminals	II-7
THE CAPACITY OF EXISTING PORT FACILITIES	II-8
CHAPTER III - WATERBORNE COMMERCE FORECASTS	III-1
COMPARISON OF NORCAL AND CORPS FORECASTS	III-1
Approaches and Assumptions	III-1
Cargo Forecasts	III-2
CONSULTANTS' RECOMMENDATION	III-5
FORECASTS ADOPTED FOR PLANNING PURPOSES BY THE REGIONAL SEAPORT POLICY COMMITTEE	III-7
USE OF TWO FORECASTS FOR PLANNING PURPOSES	III-10
Events Which Would Favor the High Range	III-11
Events Which Would Favor the Low Range	III-11
CHAPTER IV - METHODOLOGY FOR IDENTIFYING SHORTFALLS IN EXISTING PORT CAPACITY TO HANDLE FORECAST CARGOES	IV-1
OVERALL APPROACH TO ESTIMATING SHORTFALLS	IV-3
DEMAND FOR CARGO-HANDLING CAPACITY	IV-5
Military Cargo	IV-5
Seasonality of Cargo Flows	IV-6
The Effects of Incremental Growth Patterns and Exclusive Use Arrangements on the Demand for Cargo Handling Capacity	IV-11
SUPPLY OF CAPACITY FOR HANDLING CARGO	IV-13
CONSIDERATIONS REGARDING THE ESTIMATES OF SHORTFALL	IV-15
WAYS OF INCREASING EXISTING REGIONAL CAPACITY TO HANDLE SHORTFALLS	IV-16

TABLE OF CONTENTS - cont'd

	PAGE
CHAPTER V - POTENTIAL OF BAY SHORELINE SITES FOR FUTURE MARINE TERMINAL USE	V-1
SITE SELECTION	V-1
Criteria	V-1
Sites Selected	V-3
SITE SUITABILITY	V-12
Potential Port Facility Configurations	V-12
Criteria for Evaluating Site Suitability	V-13
Estimation of Potential Throughput Capacity	V-13
SUMMARY OF THE SITE SUITABILITY EVALUATIONS	V-17
Northeast Contra Costa	V-18
Northwest Contra Costa	V-18
Benicia	V-19
Vallejo	V-20
Richmond	V-20
Marin	V-21
San Francisco	V-21
Oakland	V-22
Alameda	V-22
Redwood City	V-23
Dumbarton Point	V-24
BIBLIOGRAPHY	B-1

LIST OF TABLES

Table Number		Page
1	Comparison of Capacity Estimation Methodologies	II-4
2	Corps and NORCAL Capacity Factors	II-5
3	Average Capacity Factors Used in Estimating the Capacity of New or Modified Terminals	II-7
4	Capacities of Active, Publicly Utilized Terminals	II-9
5	Comparison Summary of Cargo Forecasts	III-3
6	Forecasts of Total Dry Waterborne Cargoes, San Francisco Bay	III-5
7	Alternate Waterborne Commerce Forecasts Adopted for Planning Purposes	III-8
8	1975 Liner Cargo Movements Through California Ports	IV-8
9	Site Selection Criteria Used to Identify San Francisco Bay Shoreline Sites Havings the Potential for Port Use	V-2
10	Criteria for Evaluating the Suitability of Sites for Marine Terminal Uses	V-14

LIST OF FIGURES

Figure Number		Page
1	Study Design for Phase I, Regional Port Planning Project	I-3
2	Site Evaluation Process for Phase I, Regional Port Planning Project	I-4
3	Publicly Utilized Ports, San Francisco Bay Area	II-2
4	Waterborne Commerce Forecasts, San Francisco Bay Area	III-6
5	Alternate Waterborne Commerce Forecasts, San Francisco Bay Area	III-9
6	Process of Identifying Shortfalls in Existing Capacity to Handle Forecast Cargo	IV-4
7	San Francisco Bay Shoreline Sites	V-4
	Key	V-5
	Map 1: Northeast Contra Costa	V-6
	Map 2: Northwest Contra Costa, Vallejo & Benicia	V-7
	Map 3: Richmond and Marin	V-8
	Map 4: San Francisco	V-9
	Map 5: Oakland and Alameda	V-10
	Map 6: Redwood City and Dumbarton Point	V-11

CHAPTER I

INTRODUCTION

PURPOSE AND APPROACH OF PHASE I, REGIONAL PORT PLANNING PROJECT

The purpose of Phase I of the Regional Port Planning Project is to produce the information base that is essential to the development of a regional port plan. To accomplish this purpose, the major work tasks identified and described:

- Cargo handling capacities of existing and planned publicly utilized marine terminal facilities in San Francisco Bay;
- Waterborne commerce forecasts for San Francisco Bay for ten- and twenty-five year time horizons;
- Process of estimating shortfalls in cargo handling capacity for ten- and twenty-five year time horizons defined as the difference between the demand for capacity to handle forecast cargoes and estimates of the supply of capacity in existing and planned marine terminals; and
- San Francisco Bay shoreline sites with the potential for handling future shortfalls in capacity.

The identification of the waterborne commerce forecasts and of the capacity estimates of existing and planned marine terminals relied heavily on completed and on-going studies. The consultants' work identified, evaluated, and made recommendations about the available cargo forecasts and capacity estimates and their assumptions and

methodologies. Policy decisions as to the levels of forecasts and capacity estimates used in the remainder of this project were made by members of the Regional Seaport Policy Committee.*

These adopted cargo forecasts and capacity estimates provide the basis for identifying shortfalls in the capacity of existing and planned marine terminals to handle the cargoes forecast for the Bay Area in future years. To identify shortfalls, the cargo forecasts must be translated into forecasts of the demand for capacity to handle the cargo. These capacity demand forecasts should then be compared on a regional basis with the estimates of the supply of capacity in existing facilities to identify the capacity, in addition to what presently exists, that would be required to handle forecast cargoes.

The process of considering how capacity could be increased to handle shortfalls was begun in this Phase I effort. San Francisco Bay shoreline sites with the potential for marine terminal use were identified and several characteristics of those sites were evaluated as to their suitability for different types of port uses. The approach was designed to provide the information base for Phase II work which will consider in more detail the feasibility of adding capacity at alternative sites, and the relative weights or priorities of the different evaluative criteria in addressing the question of where the additional capacity should be provided.

PHASE I, STUDY DESIGN

The work path diagramed in Figure 1 identifies the major components of the work program of this study effort. The site evaluation process completed to provide the information for the final work item in Figure 1 is diagramed in Figure 2.

*The Metropolitan Transportation Commission (MTC) and the San Francisco Bay Conservation and Development Commission (BCDC) were the direct clients for this effort although policy decisions regarding the forecasts and capacity estimates were made by the Regional Seaport Policy Committee, made up of representatives of MTC, BCDC, the Association of Bay Area Governments (ABAG), CalTrans, U.S. Army Corps of Engineers, U.S. Maritime Administration, Port of Oakland, Port of San Francisco, Port of Redwood City, Port of Richmond, Encinal Terminals, and Benicia Port Terminal Company.

Figure 1

STUDY DESIGN FOR PHASE I, REGIONAL PORT PLANNING PROJECT

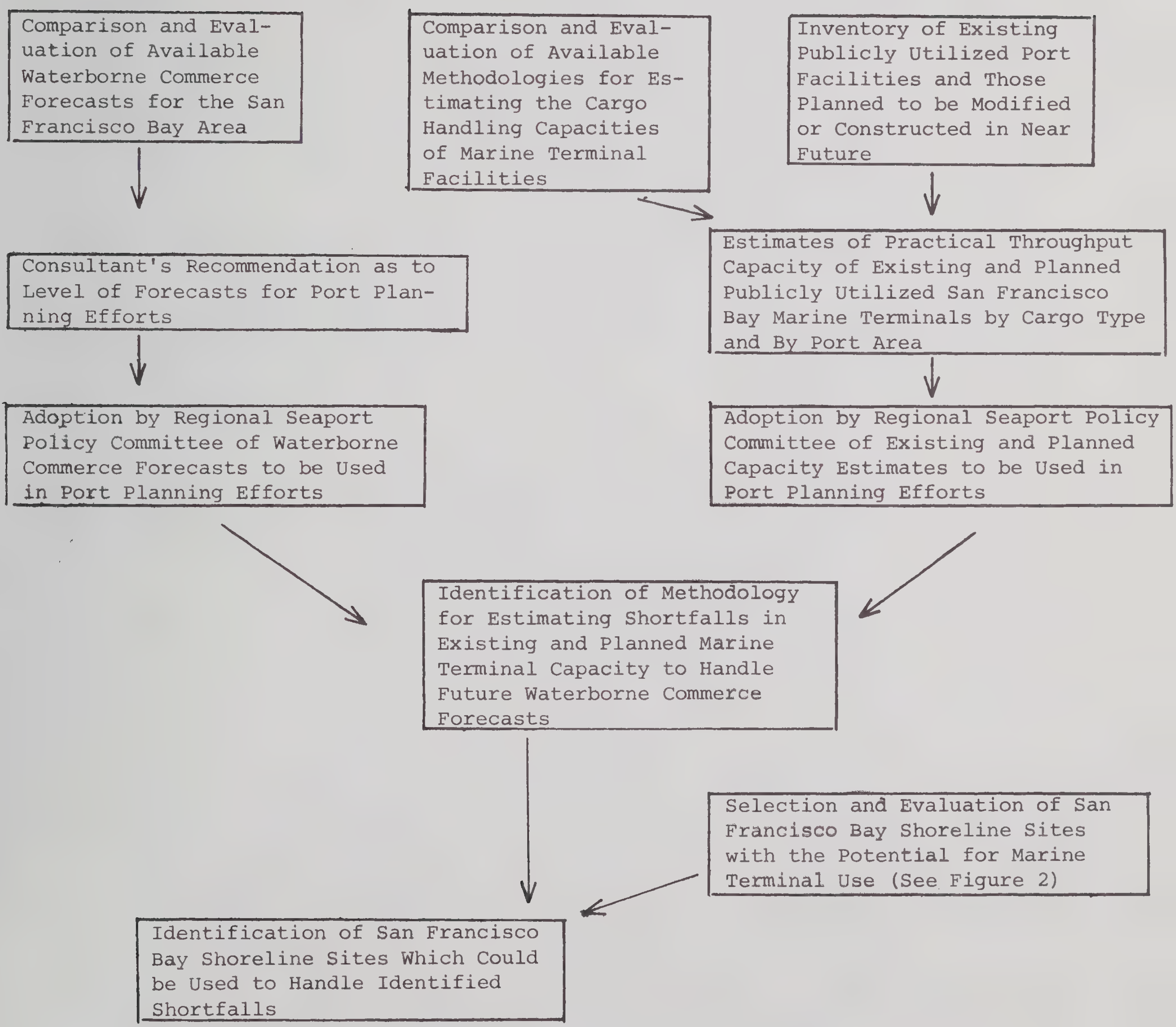
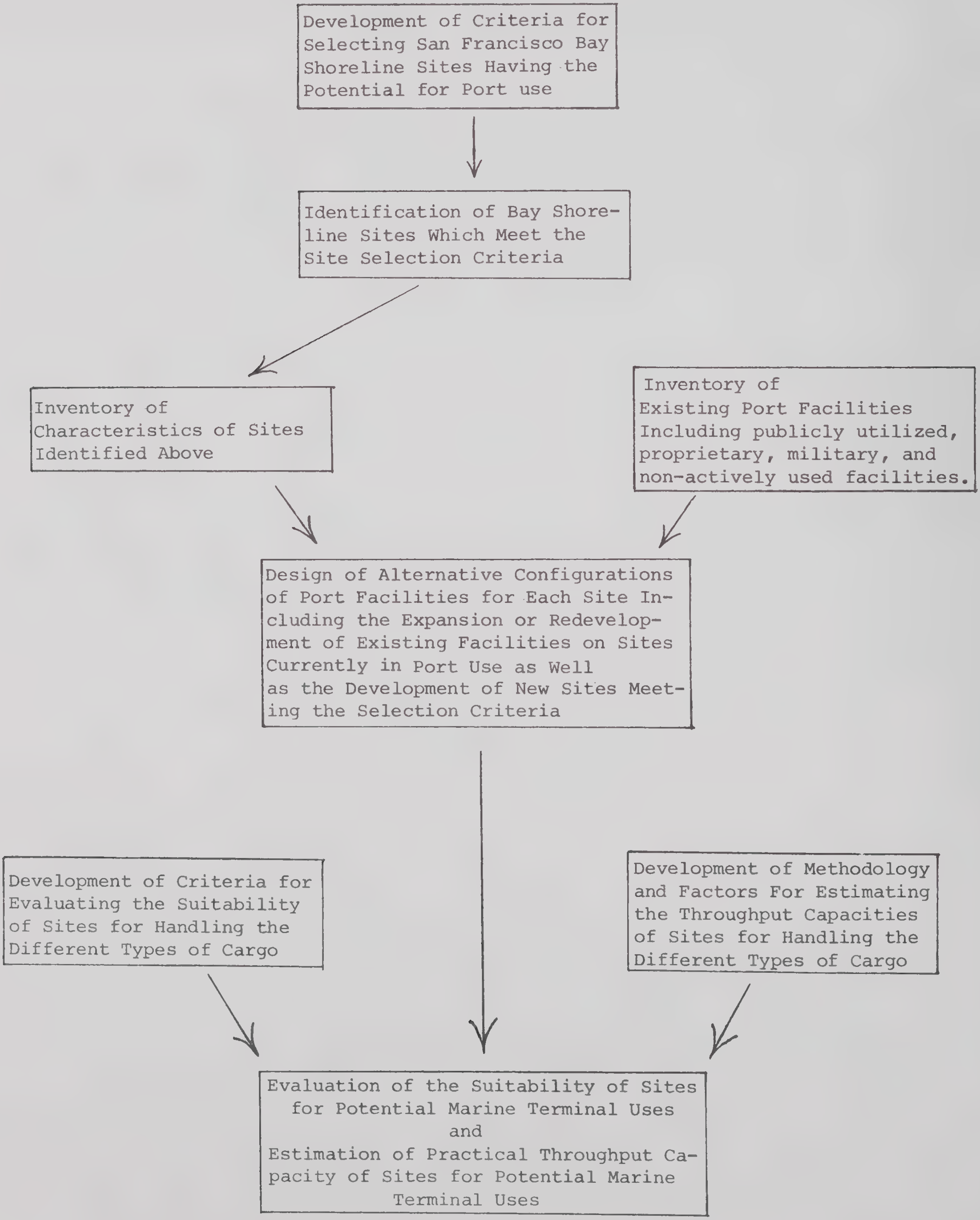


Figure 2

SITE EVALUATION PROCESS FOR PHASE I, REGIONAL PORT PLANNING PROJECT



CONTENTS OF FINAL REPORT AND TECHNICAL APPENDICES

The chapters of this final report summarize the work that has been completed. The succeeding four chapters address the four major areas of study outlined on the first page of this chapter. The two interim reports developed during the course of this study are presented in Technical Appendix Volume A. These reports provide more detailed, technical discussions of the waterborne commerce forecasts and of the capacity estimates and estimating methodologies. The working paper summarizing the site selection and evaluation process and the detailed inventories of Bay Area marine terminal facilities and of the shoreline sites with potential for marine terminal use are presented in Technical Appendix Volume B along with the site evaluation and site capacity estimation worksheets.

CHAPTER II

EXISTING PORTS AND CAPACITIES

SAN FRANCISCO BAY AREA PORTS

For the purpose of this study, the San Francisco Bay Area was defined to include the shorelines of San Francisco, San Pablo and Suisun Bays to the extent of the Bay Conservation and Development Commission's (BCDC's) jurisdiction near Collinsville in Solano County and to the Antioch Bridge in Contra Costa County. BCDC jurisdiction does not include the shoreline in Pittsburgh and Antioch, while Metropolitan Transportation Commission jurisdiction does include these areas. Within the study area, there are six publicly utilized ports with active cargo handling terminals; they are (see Figure 3): (1) Encinal Terminals, Alameda; (2) Benicia Port Terminal Company; (3) Port of Oakland; (4) Port of Redwood City; (5) Port of Richmond; and (6) Port of San Francisco.[1] Together these ports lease a total of approximately 40 terminals to operators who handle a variety of cargo types. This study has classified facilities by four cargo types: container/LASH/RORO, break-bulk, dry bulk and non-petroleum liquid bulk.[2]

[1] See Technical Appendix, Volume B for the detailed inventories of all terminal facilities in these six port areas and for somewhat less detailed inventories for all other marine terminal facilities on the Bay. Also see Corps of Engineers, San Francisco Bay Area In-Depth Study - Institutional Inventory.

[2] In Interim Report No. 2 (Technical Appendix, Volume A) of this study, a fifth cargo type called neo-bulk was used. To conform to the classification of cargo used in the forecasts discussed in Chapter III, the capacities of facilities in this chapter have been stated in terms of the four cargo types listed above with the result that the iron and steel scrap facilities previously classified as neo-bulk are classified as dry bulk and the auto and other cargo facilities previously classified as neo-bulk are classified as break-bulk.

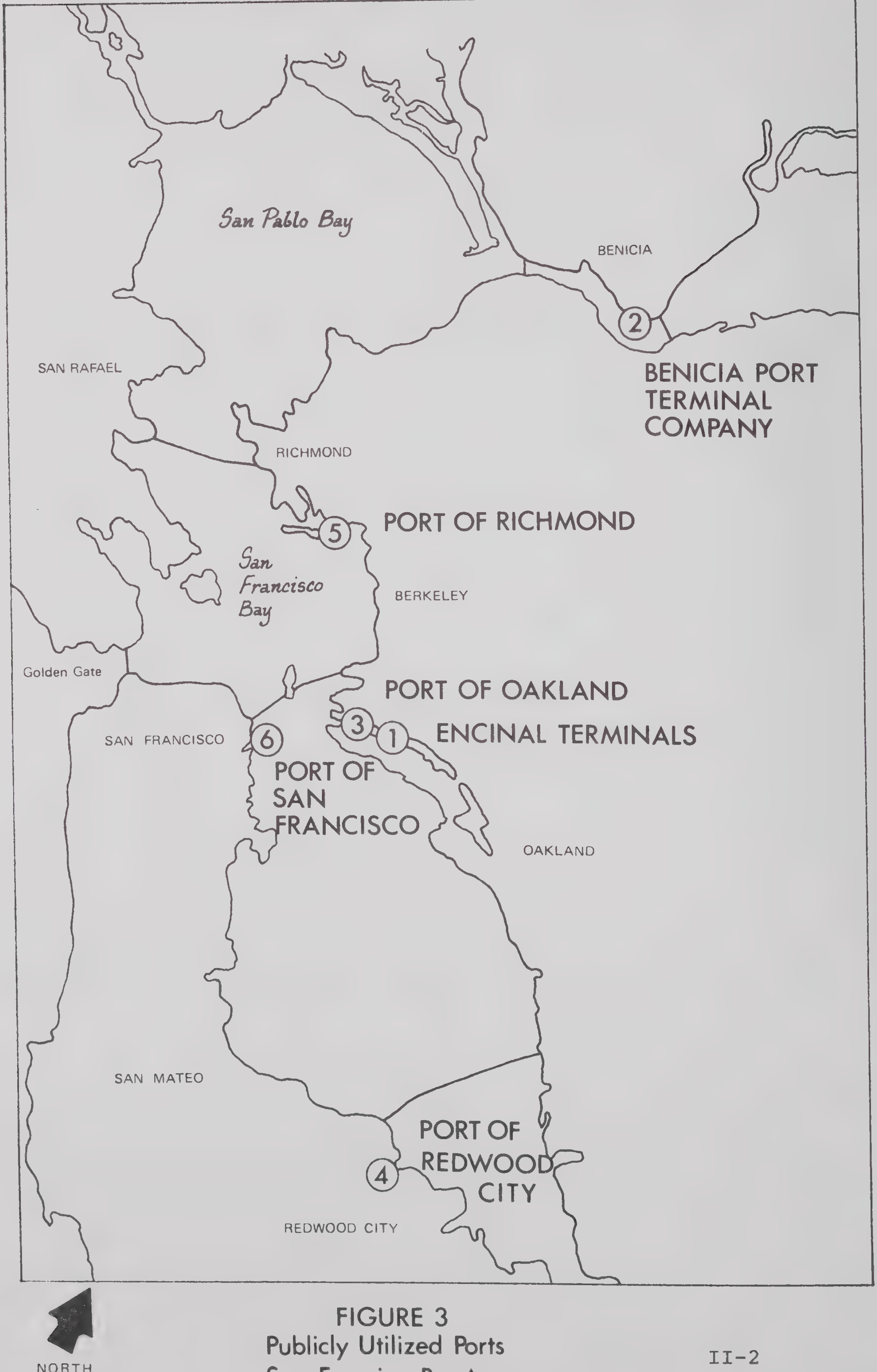


FIGURE 3
Publicly Utilized Ports
San Francisco Bay Area

The U. S. Army Corps of Engineers (Corps), in their San Francisco Bay Area In-depth Study, developed a methodology for estimating the capacity of marine terminals and applied the methodology to the Bay Area terminals. In a study jointly funded by the Northern California Ports and Terminals Bureau (NORCAL) and the U. S. Maritime Administration (MARAD), Manalytics, Inc. also developed a methodology for estimating the capacity of marine terminals and applied the methodology to the active, publicly utilized NORCAL terminals in the Bay Area. This chapter compares these existing methodologies, presents a methodology for estimating the capacity of new or modified terminals and presents the capacities of the publicly utilized terminals currently handling cargo as well as the capacities of terminals that are being modified, that are under construction, and those planned terminals that are expected to be in operation within the next five years. These capacity totals are the basis for the capacity supply estimates used to identify shortfalls as described in Chapter IV.

Comparison of Methodologies

Table 1 shows the major differences in the two capacity estimation methodologies. Table 2 shows the average values of the capacity factors calculated for each cargo type by each methodology. Despite the methodological differences, the factor values are quite similar.

Concept of Practical Capacity

Under each methodology, the estimates are of practical or effective capacity which takes into consideration the facilities and equipment available at a terminal, the institutional and administrative structure of the industry, the methods of operation

TABLE 1

Comparison of Capacity Estimation Methodologies

Characteristic	Corps	NORCAL
Capacity Restricting Activities Analyzed[1]:	Ship/apron transfer (berth capacity) Cargo storage space (storage capacity)	Ship/apron transfer apron/storage transfer storage/truck or CFS[2] transfer container parking at CFS truck parking at CFS entrance gates exit gates covered storage (CFS) open storage (containers)
Approach:	Estimate capacity values for activities above then apply standard capacity values to all Bay Area terminals, selecting the lower as the capacity measure	Estimate capacity of activities above for each Bay Area terminal based on type of cargo handled, selecting lowest as the capacity measure
Aggregation Categories:		
Terminal Type[3]		
Break-bulk	General	Break-bulk
Scrap steel	Dry bulk	Neo-bulk
Iron & steel products	General	Neo-bulk
Automobiles	General	Neo-bulk
Paper products	General	Neo-bulk
Roll on-Roll off	General	Container/LASH/RORO
Container	Container/LASH	Container/LASH/RORO
LASH	Container/LASH	Container/LASH/RORO
Dry bulk	Dry bulk	Dry bulk
Liquid bulk	Liquid bulk	Liquid bulk

[1]The activities listed for the NORCAL methodology are those used for estimating the capacity of container/LASH/RORO terminals. Similar types of activities were used for estimating the capacities of the other types of terminals.

[2]Container freight station.

[3]The Corps included petroleum products terminals in their analysis, whereas NORCAL did not and the Corps included combination container/break bulk berths in the container/LASH category, whereas NORCAL included these terminals in the break-bulk category.

Source: Interim Report #2 in Technical Appendix Volume A

TABLE 2

Corps and NORCAL Capacity Factors[1]
(short tons per year)

	Tons Per Berth	Tons Per Sq. Ft. Of Storage Area
NORCAL - Break-bulk	85,000	3.30
Neo-bulk	160,000	1.90
Average	100,000	2.80
Corps - General	105,000	2.25
NORCAL - Container/LASH/RORO	530,000	1.63
Corps - Container/LASH	470,000	0.78
NORCAL - Dry bulk	280,000	NA[2]
Corps - Dry bulk		NA[3]
NORCAL - Liquid bulk	390,000	NA[2]
Corps - Liquid bulk		NA[3]

[1]The Corps capacity factors were those applied to typical Bay Area terminal characteristics to estimate their capacity. The NORCAL factors were developed for comparability by taking a weighted average of the factors (which are annualized weekly averages) for the individual NORCAL terminals within each of the five cargo categories.

[2]Not applicable

[3]The Corps examined dry and liquid bulk terminals individually and did not present data necessary to determine these factors.

Source: Interim Report No. 2 in Technical Appendix, Volume A.

of a terminal, vessel operating practices, and the nature of cargo and ships being handled at a terminal. As estimated, the practical capacity represents economic capacity. The values of the capacity factors in Table 2 reflect the current operating practices of the users of Bay Area marine terminals. These factors have evolved over time in a manner that minimizes overall transportation costs given the present set of operational practices and institutional structures. The berth capacity factor reflects maximum practical berth utilization, the number of cranes (or other loading/unloading gear) assigned to the ships, the current practices relating to the use of longshoremen, etc. The storage capacity factors reflect the current cargo density, cargo dwell time in the terminal, etc. While these practices are changing over time, no data was presented in either the NORCAL or Corps reports which would enable a reasonable estimate of the impact of evolutionary change.

While it is physically possible to work at levels greater than practical capacity, the costs of loading and discharging cargo in those circumstances increase, often dramatically. For example, a terminal working at greater than 100% practical capacity may resort to receiving and delivering cargo during the night and on weekends, which would entail both the extra costs of overtime pay and irregular pickup and delivery schedules for shippers and consignees. Thus, while this is a possible situation in the short term, it is unlikely that such a situation would continue to exist over the long term. Most likely, if a terminal attempted to sustain such a level of operation, the increased costs would eventually result in some loss of cargo to the terminal operator. The extent of such a loss would be a function of the types of commodities involved, the amount of increase in cost, and the availability of alternatives for moving the cargo.

Methodology for Estimating Capacity of New or Modified Terminals

When estimating the throughput capacity of a new terminal or a terminal that is not actively handling cargo, only two activities need be considered: ship-apron transfer activities (berth capacity) and storage activities (gross area capacity). The capacity of the other activities is a function of equipment which can be easily acquired (for example, fork lifts) or of facilities which typically can be modified (adding truck loading/unloading positions, for example). The values of these factors presented in Table 3 are the average of the factors calculated for each of the active, publicly utilized NORCAL terminals. These factors were utilized to compute the estimates of capacity for the sites identified in Chapter V.

TABLE 3

Average Capacity Factors Used in Estimating the Capacity of New or Modified Terminals

Terminal Type	Berth Capacity (tons/berth/year)	Gross Area Capacity (tons/berth/year)
Container/LASH/RORO	530,000	0.76
Break-bulk	85,000	2.20
Neo-bulk	160,000	0.87
Dry Bulk	280,000	3.10
Liquid Bulk	390,000	3.20

Source: Interim Report No. 2 in Technical Appendix Volume A

THE CAPACITY OF EXISTING PORT FACILITIES

The NORCAL estimates of the practical capacity of current, active, publicly utilized terminals have been adopted by the Regional Seaport Policy Committee for use in this study.* In addition to the existing active, publicly utilized terminals, the practical capacities of modified, under construction and planned terminals which are expected to be completed within five years have been estimated using the methodology developed for this study to estimate the capacity of new or modified terminals as described above.

The total capacity estimates for each of the Bay Area ports are shown in Table 4. These estimates will be referred to in the rest of this report as existing capacity.

*Although the capacities for the Port of Redwood City were not included in the NORCAL report they were estimated using the methodology developed as a part of this study effort and adopted along with the estimates for the other port areas.

Since the capacities of individual terminals were not presented in either report, the Corps capacity estimates could not be compared with the NORCAL estimates. The Corps estimates included terminals which handle petroleum products, private terminals, and terminals which were not actively handling cargo while the NORCAL estimates did not. Interim Report No. 2 in Technical Appendix, Volume A presents both sets of estimates in more detail.

TABLE 4

Capacities of Active, Publicly Utilized Terminals[1]
(000's Short Tons per Year)

Terminal Type	BAY AREA PORTS						
	San Francisco	Oakland	Redwood City	Alameda	Benicia	Richmond	Total
Container/ LASH/RORO	1,630	5,290	---	340	---	530	7,790
Break-bulk	2,180	1,010	85	370	80	110	3,835
Dry bulk	230	150	320	---	340	250	1,290
Liquid bulk[2]	400	320	---	200	---	900	1,820
Total	4,440	6,770	405	910	420	1,790	14,735

[1]Includes practical capacities of currently active, publicly-utilized terminals plus those public terminals being modified, under construction and terminals to be constructed in the near future. Included in this latter group are: Pier 94, Port of San Francisco; berths 2, 3 and 4, Outer Harbor, Port of Oakland; Wharf 3, Port of Redwood City; and Terminal 3, Port of Richmond.

[2]Excludes capacities of crude petroleum and petroleum products terminals.

Source: Interim Report No. 2 in Technical Appendix, Volume A.

CHAPTER III

WATERBORNE COMMERCE FORECASTS

The development of a regional port plan requires a forecast of the waterborne cargoes which can reasonably be expected to move through Bay Area ports during the last quarter of this century. This cargo forecast is the basis upon which a forecast of the demand for cargo handling facilities can be developed.

To provide such a forecast, the consultants reviewed and evaluated the two major forecasts of commercial waterborne traffic which have been done for the Bay Area - one by Policy Planning Consultants for the Northern California Ports and Terminal Bureau, Inc. (NORCAL) and the U. S. Maritime Administration (MARAD), and the other by the U. S. Army Corps of Engineers (Corps). The purpose of this review and evaluation was to make a recommendation to the Regional Seaport Policy Committee who made the decision as to the level of cargo forecasts to be used in port planning efforts. This recommendation was to include an identification and explanation of the differences between forecasts and was to be based on an evaluation of the two existing forecasts in terms of the methodologies and techniques used and the explicit and implicit assumptions upon which each is based.

COMPARISON OF NORCAL AND CORPS FORECASTS

Approaches and Assumptions

The two studies forecasted commercial cargo movements for the years 1980, 2000, and 2020 (NORCAL also forecast 1990). High, medium and low forecasts were developed for each of these years. The major focus was on dry cargoes and each study

disaggregated the totals by three cargo types - container/LASH/RORO break-bulk and dry bulk. Only the Corps of Engineers' study examined nonpetroleum liquid bulk cargoes. Each developed forecasts for cargoes through San Francisco Bay Area ports, excluding the Delta area ports.

Both forecasts employ the same basic and widely accepted framework about the factors that generate cargo flows -- that is, cargoes are dependent upon real economic growth at home and abroad, which is derived from population and productivity growth. However, technically, they follow different approaches within the same basic demand-oriented framework. NORCAL began by forecasting, on a demand basis, world and U.S. dry cargo movements, thence proceeding to find the West Coast share of U. S. cargoes and then the San Francisco Bay share of West Coast cargoes. NORCAL did not distinguish among different commodity groupings. The Corps employed a forecast based on 20 different commodity groupings and they forecasted San Francisco Bay cargoes directly, without first focusing on total U. S. or total West Coast cargoes. A summary comparison of these forecasting approaches is presented in Table 5.

Cargo Forecasts

The NORCAL forecast, the Corps forecast, and the ratio of the NORCAL forecast to that of the Corps are shown in Table 6 for total dry waterborne cargoes. For simplicity, the comparison is based only on the medium range forecasts. The reader will notice the strong accordance in 1980 (95%) getting weaker by the year 2000 (135%) and, finally, very far apart by the year 2020 (222%).

Table 5

Comparison Summary of Cargo Forecasts

	General Approach	Key Variables	Method	Assumptions
NORCAL	Forecasted world dry cargo	World GNP	Projected OECD (world) cargo based on growth in real GNP	OECD GNP to grow at 4.6% annually and cargo at 5.6% annually
	Forecasted U.S. dry cargo	U. S. GNP	Projected U.S. cargo based on growth in U.S. GNP	U.S. GNP to grow at 3.6% annually and U.S. cargo at 4.0%
	Forecasted West Coast share of U.S. cargoes		Used straight line trend for West Coast share of U.S. market	West Coast share of U.S. cargo to grow from 17.0% in 1973 to 42.5% in 2020
	Forecasted Bay Area share of West Coast market		Assumed a value for Bay Area's share of West Coast trade which levels off declining trend	Bay Area share of West Coast continues to decline from 18.7% in 1973 to 15% in 1980 and remains constant thereafter
U. S. Army Corps of Engineers	Prepared forecast of 20 separate commodities shipped into and out of Bay Area	Population of importing region	Used population and income from OBERS	Range based on high & low U.S. population & personal income forecasts
		Real income of importing region		
	Aggregated separate commodity forecasts to reach a Bay Area Total	Relative prices of commodities imported & other goods & services	Extrapolated prices based on trend line & adjusted growth rates if tonnage too high	Range based on stationary prices & continuation of past trends
		Time trend	Used world imports of a specific commodity as a substitute for foreign income used to purchase U.S. exports	

Table 5 (Cont'd.)

	General Approach	Comments on Available Forecasts	Assumptions	Other Comments
Consultants' Recommendation	DRY CARGOES Modified NORCAL forecast to assume both West Coast share of U.S. cargo and Bay Area share of West Coast cargo stabilize beyond 1980. Further modified forecasts to account for recent worldwide recession Considered validity of forecast result as compared with historical tonnage growth and projected growth in real personal income and real GNP	NORCAL Annual compounded growth rate of Bay Region dry cargoes from 1973 to 2000 exceed historical rate since 1950 (5.5% as compared with 3.5%) Large growth forecast for West Coast share of U.S. cargo seems too optimistic CORPS Adjusted growth rates may be conservative in long run Better accuracy obtained if Corps focused on income of major Bay Area customers; i.e., Japan and Far East, but generally OK	Assumed West Coast share would remain constant at 20.8% after 1980 Annual compounded growth rate of Bay Area dry cargo of 4.2% per year, 1973 to 2000 Reduced 1980 Corps forecast by 5% to reflect economies lost ground after recession and reduced 2000 forecast by 2.5%	Did not use NORCAL cargo split because disputed the growth rate in containerized portion Used Corps cargo split because it reflects a commodity-based forecast and includes total cargo levels close to recommended forecast
	LIQUID CARGOES Recommended Corps forecast for nonpetroleum liquid bulk cargoes			

Source: Interim Report No. 1 in Technical Appendix Volume A

TABLE 6

Forecasts of Total Dry Waterborne Cargoes, San Francisco Bay (millions of short tons)

1973 = 10.2

	1980	2000	2020
NORCAL	13.5	43.0	122.0
Corps	14.2	31.8	54.9
NORCAL ÷ Corps (%)	95	135	222

Source: Trade Outlook of the Northern California Ports: Year 2000 and Beyond by Policy Planning Consultants and San Francisco Bay Area In-Depth Study, by U. S. Army Corps of Engineers, San Francisco District.

CONSULTANTS' RECOMMENDATION

Based upon a careful review and evaluation of the existing forecasts, including the validity of the growth rates and the consistency of the assumptions inherent in them, the consultants recommended modifications to the existing forecasts* which had the effect of creating a third forecast for dry cargo (as explained in Table 5 and shown in Figure 4). The Corps'

*A detailed discussion of the basis for these modifications is presented in the consultants' Interim Report No. 1, contained in Technical Appendix Volume A of this report.

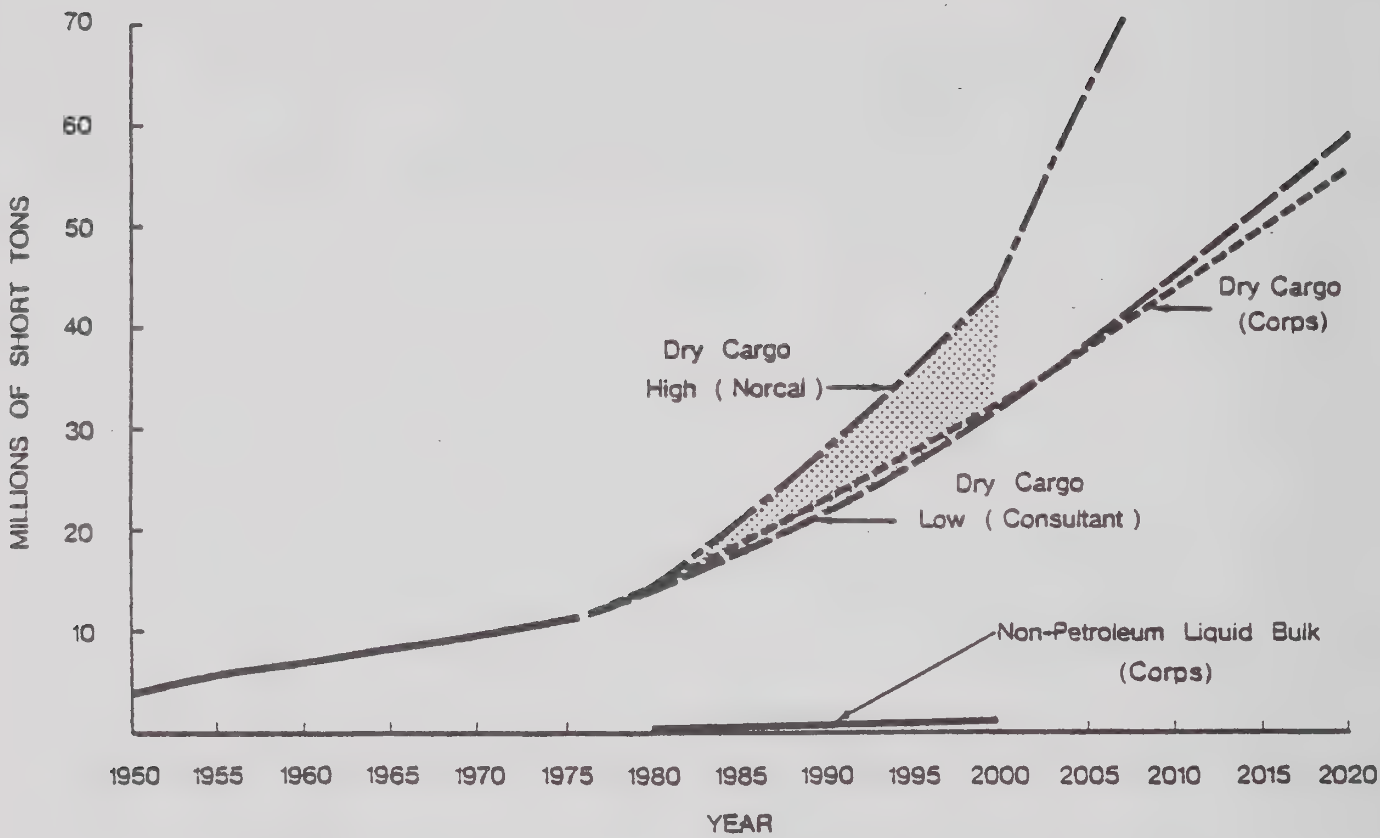


FIGURE 4

WATERBORNE COMMERCE FORECASTS
SAN FRANCISCO BAY AREA

(Millions of Short Tons)

	1950	1955	1960	1965	1970	1973			1980	1990	2000	2020
DRY CARGO	4.3	6.2	7.0	8.3	9.3	10.2			–	–	–	–
								Corps	14.2	–	31.8	54.9
								Norcal	13.5	27.0	43.0	122.0
								Consultant	13.5	20.8	31.0	58.5
NON-PETROLEUM LIQUID BULK								Corps	0.515	0.93	1.395	–

forecast for nonpetroleum liquid bulk cargo was recommended for use without modification.

The consultants' recommendation of a dry cargo forecast was derived by modifying the NORCAL forecast to assume that both the West Coast share of U. S. cargoes and the San Francisco Bay share of West Coast cargoes will stabilize by 1980 (the former has been increasing, the latter has been declining). A further modification was then made to account for the recent worldwide recession.

The result of these modifications was a dry cargo forecast which is identical to the NORCAL forecast through 1980, but which becomes more similar to the Corps forecast by the year 2000 (end of the planning period). The cargo split of the Corps' commodity-based forecast was used by the consultant to disaggregate the recommended Bay Area dry cargo totals by specific cargo types.

FORECASTS ADOPTED FOR PLANNING PURPOSES BY THE REGIONAL SEAPORT POLICY COMMITTEE

Having reviewed and discussed the forecasts, the Regional Seaport Policy Committee adopted for planning purposes the forecast range for dry cargo embraced by the NORCAL medium forecast and the consultants' recommendation. The single forecast for nonpetroleum liquid bulk cargo was also adopted for use. The information in Table 7 and Figure 5 summarize the adopted forecasts by cargo type. Essentially (as discussed below) these two forecasts reflect two different views of the possibilities for future growth of Bay Area cargoes. As such, they provide the basis for two forecasts of the demand for capacity to handle the growth of cargoes and for two estimates of the shortfalls in facilities for handling each cargo type (as discussed in Chapter IV).

TABLE 7

Alternate Waterborne Commerce Forecasts
Adopted for Planning Purposes

San Francisco Bay Area
(millions of short tons)

Cargo Type	1980	1985	1990	1995	2000
TOTAL DRY CARGO*	13.5 13.5	16.8 19.4	20.8 27.0	25.6 34.9	31.0 43.0
Container/LASH/RORO	6.1 6.0	8.6 10.5	11.4 16.8	15.0 23.4	18.9 30.0
Break-bulk	3.5 3.9	3.5 4.1	3.7 4.2	4.0 4.5	4.0 5.0
Dry Bulk	3.9 3.6	4.7 4.8	5.6 6.0	6.6 7.0	8.1 8.0
NONPETROLEUM LIQUID BULK	0.5	0.7	0.9	1.2	1.4

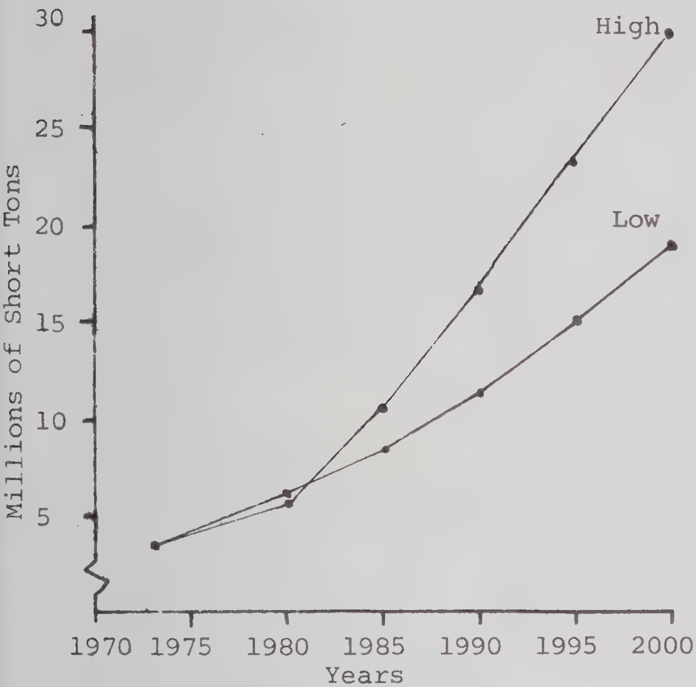
*Disaggregations of dry cargo forecasts are based on the Corps' cargo mix for the lower forecast (top number) and the NORCAL cargo mix for the higher forecast (bottom number).

Source: Dry cargoes: Consultants recommended forecast (top number) and NORCAL's medium range forecast (bottom number).
Liquid cargoes: U. S. Army Corps of Engineers.

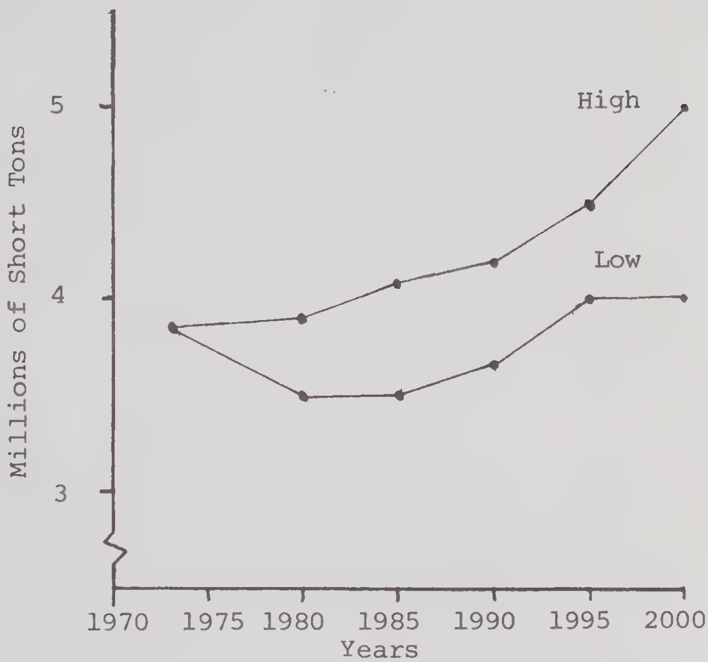
Figure 5

Alternate Waterborne Commerce Forecasts

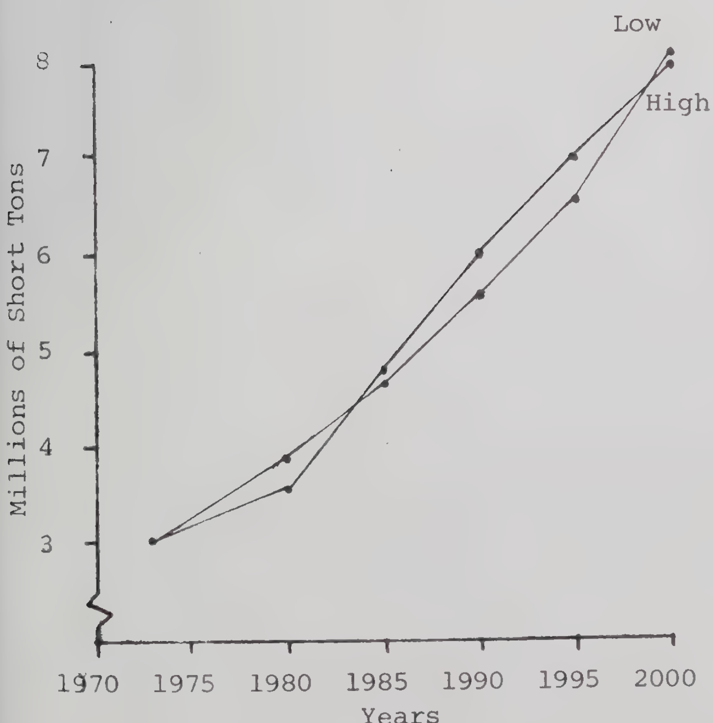
San Francisco Bay Area



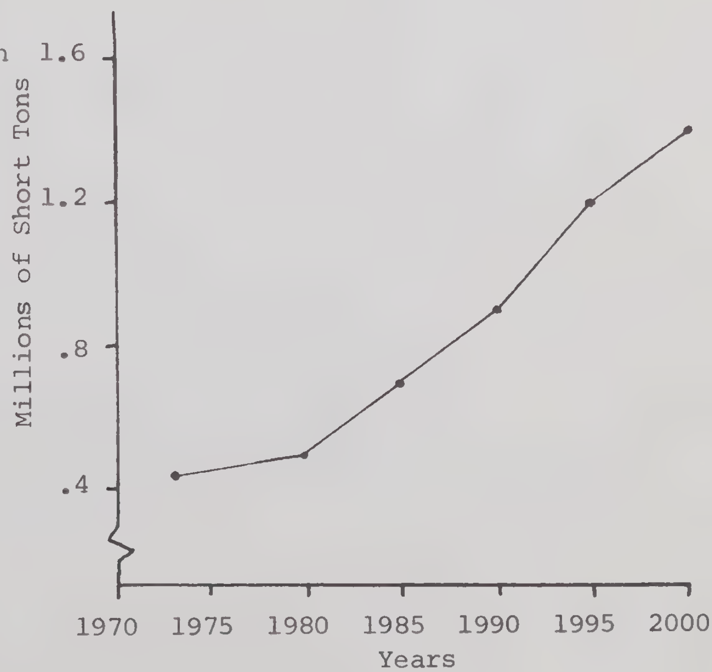
Container/LASH/RORO



Break-bulk



Dry Bulk



Nonpetroleum Liquid Bulk

Source: Table 7, p. III-8.

USE OF TWO FORECASTS FOR PLANNING PURPOSES

One can place greatest confidence in the 1980 values for either of the forecasts; the degree of confidence and expected accuracy diminishes farther out into the future. Because of this, the forecasts should be scrutinized again sometime in the mid-1980's. Within the next decade sufficient additional data will have been accumulated so that the assumptions and relationships embedded in each forecast can be reassessed - the West Coast cargo growth, the division of West Coast cargoes among the several competing West Coast ports, the growth rate of GNP, the cargo-to-GNP relationship, etc.

The use of the two adopted forecasts for planning purposes provides for sufficient flexibility to allow for a variety of contingent possibilities as to what the future may bring. Most likely, the actual evolution of cargo trends towards either of the forecasted amounts will be gradual and therefore identifiable over time. In general, the high traffic level reflects a "future looking" potential for growth of traffic through the Bay Area; the lower forecast represents a "past behavior oriented" expectation for growth of traffic which does not assume any major economic or political events which would significantly alter the present interport competitive situation of the Bay Area and the West Coast. Thus, the likelihood that one or the other forecast will occur depends upon the probabilities placed on those future events which would lead to either the high or low range.*

*The events summarized as favoring the likelihood of either forecast are not necessarily all inclusive and are generalized for summary purposes in this report.

Events Which Would Favor the High Range

The events that would favor the higher forecast include the following:

- Continually rising West Coast share of U.S. traffic;
- Increasing Bay Area share of the West Coast cargoes due to improved competitive position;
- Very high growth rate of Far East economies;
- Establishment of major trade between Russia and/or China and the U.S.;
- Emergence of Indonesia, Taiwan, Hong Kong, Korea and Singapore as large exporters to the U.S.;
- Closure of the Panama Canal, which would require routing trade between the U.S. Midwest, East and Gulf and the Far East via the U.S. West Coast;
- Significant increase in West Coast trade with Australia; and
- Emergence of entirely new and important bulk commodity movements currently absent from the traditional composition of Bay Area cargoes (e.g., coal, phosphate rock, etc.).

Events Which Would Favor the Low Range

The events that would favor the lower forecast include the following:

- Constant West Coast share of U.S. traffic after 1980;
- Constant Bay Area share of West Coast cargoes;
- Unchanging commodity mix of Bay Area cargoes;
- Declining rate of economic growth in Japan (the end of the Japanese trade "boom") due to recently higher oil import prices and overall Japanese economic maturity;
- Peaking of the shift to containerization as a market development tool; and
- Restrictive trade barriers as a result of increased nationalism in foreign countries or in the U.S.

CHAPTER IV

METHODOLOGY FOR IDENTIFYING SHORTFALLS IN EXISTING PORT CAPACITY TO HANDLE FORECAST CARGOES

An important component in the development of a regional port plan is the identification of shortfalls in the capacities of existing and planned marine terminals to handle the waterborne cargoes forecast for the Bay Area. The shortfalls are defined as the difference between the demand for capacity to handle forecast cargoes and the existing supply of capacity in currently active and planned marine terminal facilities. As such, estimates of shortfall identify the capacity, in addition to what exists, that would be required to handle forecast cargoes.

It is the purpose of this chapter to describe the concept of shortfall and to explain the approach for estimating shortfalls. The actual identification of the cargo types for which shortfalls in capacity are likely to develop in 1985 and 2000 will be completed in the next phases of this port planning project.

CONCEPT OF SHORTFALL

The concept of shortfall describes the relationship between the variety of factors which determine: (1) whether forecast cargoes can be accommodated at existing Bay Area port facilities; and (2) if not, the magnitude of additional capacity required to handle cargoes forecast for given future time periods. The waterborne commerce forecasts in Chapter III and the port capacity estimates in Chapter II provide the foundation for this concept. However, there are system-related factors in addition to those incorporated within the forecasts and capacity estimates which must be accounted for before conclusions regarding shortfalls can be reached.

First of all, the cargo forecasts must be translated into forecasts of the demand for capacity to handle these cargoes before conclusions can be reached as to whether existing capacities are likely to be sufficient. As is true for a variety of situations, such as for the production of automobiles, for example, a forecast of the number of products (autos) is not the same as a forecast of the facilities needed to produce those products. Thus, while the cargo forecasts from Chapter III are the basis of the forecasts of the demand for cargo-handling facilities, there are additional factors which must be considered when estimating capacity demand. These factors can be identified and explained as either being a function of the cargo forecasts or as being amounts of capacity required in addition to them.

Secondly, the supply of capacity must be estimated by adding the capacities of active, nonpublicly utilized facilities which are handling significant amounts of a particular cargo type to the capacity estimates for the publicly utilized facilities as identified in Chapter II. Since a significant portion of waterborne cargo moves through Bay region terminal facilities which are not publicly utilized (such as the proprietary and military facilities), the available supply of capacity would be incomplete without the estimates for both the publicly and nonpublicly utilized facilities. The technological, economic, and institutional factors discussed in Chapter II as determining the capacities of the publicly utilized facilities would also apply to the estimates for those facilities which are not publicly utilized.

Conclusions as to whether there are likely to be shortfalls in available capacity at any given future time depend upon the comparison of the capacity demand forecasts with the capacity supply estimates.

By definition, the concept of shortfall assumes that the cargoes forecast for the Bay Area are handled. While estimates of shortfall do not imply that amounts of cargo-handling capacity equal to them should be planned for and added, they provide the basis for considering the question of how additional capacity could be provided if the forecast cargoes are to be handled.

OVERALL APPROACH TO ESTIMATING SHORTFALLS

The approach for estimating shortfalls is summarized in Figure 6. On the demand side, the figure identifies three factors in addition to those incorporated in the commercial cargo forecasts which must be accounted for in estimating shortfalls: military cargoes, seasonality of cargo movements, and incremental development patterns and exclusive use arrangements. On the supply side, the figure identifies that the capacity estimates of non-publicly utilized facilities should be added to those for the publicly utilized facilities where appropriate.

Detailed explanation of each of the above factors and considerations involved in estimating capacity demand, supply and shortfall is given in the next few sections of this chapter. The technological, economic and institutional factors influencing the capacity estimates and forecasts are discussed in detail in Chapters II and III respectively.

In the discussions which follow, data and information are presented to identify the current nature of each additional factor. Additional research and analysis can be completed in the next phase of this port planning project to provide more back-up for the estimates of each factor and to identify how these factors and those implicit in the present practical capacity estimates may be expected to change in the future. Since MTC and BCDC desire such work, they have requested that conclusions as to shortfalls in future years await its completion.

Figure 6

Process of Identifying Shortfalls
In Existing Capacity to Handle Forecast Cargo

DEMAND	*minus*	SUPPLY	*equals*	SHORTFALL
for		of		of
Cargo Handling Capacity for 1985 and 2000		Existing Cargo Handling Capacity		Existing Capacity to Handle Forecast Cargoes in 1985 and 2000
estimated on the basis of		*estimated on the basis of*		*considering*
Commercial Cargo Forecasts		Capacity of Existing and Planned Publicly Utilized Marine Terminals		Interchangeability of Modes
plus, where appropriate, factors accounting for		*plus, where appropriate*		*and*
Military Cargoes, Seasonality of Cargo Movements, and Incremental Development Patterns and Exclusive Use Arrangements		Capacity of Currently Active, Proprietary and Military Terminal Facilities		Needs for Specialized Types of Facilities
considering		*considering*		
Technological, Economic, and Institutional Settings Which Determine Above Factors		Technological, Economic, and Institutional Settings which Determine Capacity Estimates		

Source: Gruen Gruen + Associates and Manalytics, Inc.

DEMAND FOR CARGO-HANDLING CAPACITY

The demand for capacity to handle the forecast cargoes is estimated by adding to the commercial cargo forecasts in Chapter III (Table 7), the amounts of additional capacity explained and described in the sections which follow. As discussed, it is the case for any given year that the amount of annual capacity available for handling waterborne cargoes exceeds the average annual amount of cargo moving through those facilities. Thus, the capacity demand estimates will exceed the cargo forecasts.

Military Cargo

The two forecasts adopted for use in this study and described in Chapter III consider only commercial cargo movements.[1] Historically, however, significant amounts of military cargo have moved through commercial terminals in the Bay Area (such as those operated for or by American President Lines, Ltd., and Sea-Land Service, Inc.) and through military terminals (such as the Naval Supply Center). Thus, estimates of the demand for capacity must include a component for the flow of military cargoes even though their overall magnitude has recently not been large relative to the volume of commercial cargo and their future magnitude is difficult to estimate.

In fiscal 1976, for example, dry military cargo moved through Bay Area ports in the following quantities:

Containerized	649,000 short tons
Break-bulk	256,000 short tons
Total	905,000 short tons[2]

[1] Commercial cargo movements generated by military activity such as the support of military bases in Japan and the Vietnam War have been included in the data base upon which the commercial cargo forecasts were developed. Military cargo, as discussed here, however, was not included.

[2] Source of information: Analysis of Port Traffic, Military Sealift Command Pacific, Department of the Navy.

Of the total of 905,000 short tons, approximately 7,000 short tons moved on Military Sealift Command (MSC) vessels and the balance on commercial and chartered vessels. A very large proportion of the containerized military cargo moved through commercial terminals. The break-bulk cargo moved through both commercial and military terminals.

For the purpose of estimating shortfalls, one approach would be to use this most recent information as an estimate of military cargoes in future years and to identify the effect of this amount on the future demand for terminal capacity. Another approach would be to try to estimate how this recent magnitude may be expected to change in future years and to include the expected future amounts in the estimates of the demand for capacity. Under each approach, the estimate of the flow of military cargoes should be added to the commercial cargo forecast in estimating the demand for capacity to handle that cargo.

Seasonality of Cargo Flows

The capacities of existing and planned Bay Area terminals presented in Chapter II are essentially annualized weekly capacities. Consequently, the capacities include an allowance for the daily and weekly peak cargo movements. These peaks generally occur on the land side of the terminal - that is, at the interface between the terminal and inland transportation. Shippers delivering cargo to a terminal will tend to arrive between 8:00 a.m. and 10:00 a.m. and between 1:00 p.m. and 3:00 p.m. and not deliver at night, thereby causing peak demands throughout the day. Shippers also tend to deliver cargo only on weekdays, thereby creating peak demands throughout the week.

While the Bay Area capacities presented in Chapter II allow for these daily and weekly peak demands, no allowance has been made

for long term or seasonal peak demands (monthly peaks, for example) in either the capacity estimates or the annual average cargo forecasts presented in Chapter III. Consequently, an allowance for long term or seasonal peaks in the movement of cargoes must be made in estimating the demand for capacity to handle a given amount of cargo.

Table 8 presents data identifying the total and Trade Route 29 (Far East) liner cargo* moving through California ports in 1975. These data provide information as to the seasonal nature of the flow of cargo.

As shown, the peak month for total movements into and out of California ports in 1975 was October, with 750,000 short tons of liner cargoes. Since the cargo actually moved through California ports, it is reasonable to assume that the capacity of the ports is approximately 750,000 tons per month, or 9,000,000 tons per year. However, the average monthly movement was 647,000 tons (7,769,000 divided by 12 months, as shown in Table 8). If the capacity of the California terminals were actually 647,000 tons per month, a detailed analysis of the data in Table 8 shows that some of the cargo would have to wait up to seven months before it could be carried. Thus, some of the cargo would be "lost" under these circumstances, so that the actual cargo movement would have been less than the total shown in Table 8 (7,769,000 short tons).

Review of this data also indicates that the appropriate peak period to be considered is a month, since monthly cargo flows accurately reflect peak demand on marine terminals. Periods of a week or two in duration need not be considered since some vessel operators only provide weekly or biweekly service.

*Cargo moving on regularly scheduled vessels such as those operated by Sea-Land Service, Inc., American President Lines, Ltd., etc.

TABLE 8

1975 Liner Cargo Movements Through California Ports
(000 Short Tons)

Month	Trade Route 29 Imports	Trade Route 29 Exports	Trade Route 29 Total	Total[1] Imports	Total[1] Exports	Total[1] Total
January	200	244	444	348	388	736
February	124	210	334	250	332	582
March	157	231	388	258	354	612
April	160	246	406	264	372	636
May	158	241	399	257	389	646
June	168	262	430	284	387	671
July	172	210	382	257	315	572
August	162	212	374	262	352	614
September	202	254	456	306	364	670
October	198	312	510	290	460	750
November	170	236	406	273	386	659
December	172	229	401	276	345	621
TOTAL	2,043	2,887	4,930	3,325	4,444	7,769
Average Month	170	241	411	277	370	647
Peak Month	Sept	Oct	Oct	Sept	Oct	Oct
Peak Ratio[2]	1.19	1.29	1.24	1.10	1.24	1.16

[1] Excluding domestic movements.

[2] Tons in peak month divided by tons in average month.

Source: U.S. Waterborne Exports and Imports, FT985, Bureau of the Census, U. S. Department of Commerce.

Quarterly peak periods will also not accurately reflect the actual peak demand. Consideration of a quarterly period implies that cargo may wait from one month to another throughout the quarter without the danger of "losing" cargo. Examining the data in Table 8, use of the peak quarter instead of the peak month would understate the peak requirement, since cargo movement in the peak quarter is only 5% greater than the average quarter, whereas the movement in the peak month is 16% greater than average.

Data of the type presented in Table 8 are not, of themselves, sufficient to determine the seasonal demand on Bay Area terminals. Other factors must be considered in drawing conclusions from this data, such as cargo density and whether cargoes are containerized. The cargo densities on Trade Route 29, for example, are such that there are actually more loaded import containers than loaded* export containers.

Consequently, container operators calling at the Bay Area only and not at any other west coast ports, and serving Trade Route 29, will have a peak month 19% higher than the average month (since operators have to have balanced container movements) as shown for imports in Table 8 (peak ratio of 1.19). However, a container operator making the Bay Area its last port of call on the west coast may handle more exports than imports in the bay and experience a peak ratio of 1.29 (see Table 8 for Trade Route 29 exports). A break-bulk operator serving Trade Route 29, on the other hand, would experience the peak ratio of the

*Either actually full or weight-limited.

total movements, or 1.24 (see Table 8 for Trade Route 29 total). Therefore, an operator serving only Trade Route 29 would experience a peak ratio of between 1.19 and 1.29. If an operator served all trade routes, then the range of peak ratios would be between 1.10 and 1.24 (as shown in Table 8).

In developing an estimate of the appropriate peak ratio to be used in estimating shortfalls for a regional planning effort of this type, a judgement could be made on the basis of the data in Table 8 and on consideration of the other factors described above. Similar data describing cargo movements for other years could be collected to provide some perspective on how peak ratios may have changed and consideration could be given to how and why these ratios may be expected to change in the future.

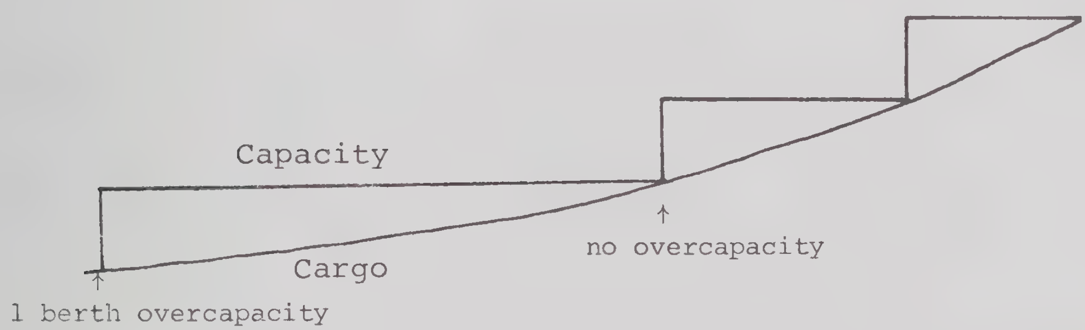
In any case, the peak ratio indicates that the capacity of terminals serving liner operators (container/LASH/RORO and breakbulk) should be greater than the annual cargo movement by an amount equal to that ratio. For example, if the ratio to be used were 1.19, then the capacity of these terminals should be at least 19% greater than the cargo movement or forecast if those cargoes are to be handled.

Bulk liquid and dry bulk terminals in the Bay Area are typically "keyed" to a production process. Because the production processes tend to have little or no seasonality, it is likely that dry bulk and liquid bulk terminals will not have significant seasonal peak demands.

The Effects of Incremental Growth Patterns and Exclusive Use Arrangements on the Demand for Cargo Handling Capacity

Cargo movements tend to grow in a continuous manner, but the handling capacity of a region such as the Bay Area grows in incremental steps as new berths or terminals are constructed. As a result, some amount of capacity in addition to what is required is available for a time after new berths or terminals are built. We refer to this amount as "overcapacity".

For example, consider the addition of one berth as cargo movements increase through the years. In this example, the average amount of overcapacity that exists over time is equivalent to approximately half a berth, as illustrated below.



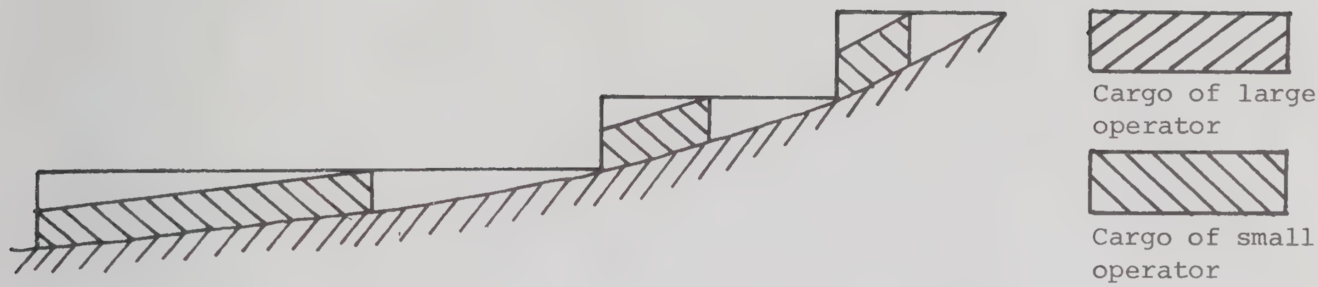
If a vessel operator could use any terminal in a region such as the Bay Area, the minimum average amount of overcapacity within the region could theoretically be approximately half of a berth. However, achieving such a minimum amount could be economically impractical. For example, if the capacity of a terminal was limited by storage space, then cargo awaiting a ship may end up

being stored at a different terminal from the location of the ship. In that case the cost of moving that cargo between its storage location and the ship could be prohibitive.

However, Bay Area terminals are presently operated for the exclusive use of a limited number of vessel operators, so that short-term overcapacity at one terminal (such as the Sea-Land terminal in Oakland) is not available to users of other terminals (such as the Pacific Far East Lines, Inc., which uses a terminal in San Francisco). Therefore, the average amount of overcapacity that exists within the region is much greater than the theoretical minimum of half a berth. In fact, if no operators could shift from one terminal to another, the average resulting overcapacity would be equal to approximately one-half of a berth per terminal for all terminals in the region.

This one-half of a berth in overcapacity assumes that it is economically feasible and advantageous to build one berth or the addition of one berth at a time. However, economic considerations may dictate that multi-berth terminals be constructed, in which case the average amount of overcapacity at those facilities would be equivalent to approximately half a terminal.

Some terminal operators solicit small vessel operators to use this overcapacity until they themselves need it. For example, a container terminal operator with a two- or three-berth terminal serving one large container vessel operator may solicit a small container operator to use any overcapacity. When the carryings of the two container operators increase to the point where the terminal is operating at capacity, the small container operator moves to another terminal (as illustrated below). The effect of this situation is to reduce the average amount of overcapacity as shown below (overcapacity is reduced to one-quarter of a berth per terminal in this example):



When viewed from the regional perspective, it is very difficult to identify the actual amount of overcapacity available at all of the terminals at any one point in time, or to estimate this amount for future points in time (such as 1985 and 2000). Thus, for the purpose of identifying regional shortfalls, it is appropriate to assume the average situation. The amount of overcapacity available in the region will then be equal to the sum of the average amounts of overcapacity existing at all of the individual terminals.

Therefore, the overcapacity required because of the incremental growth of terminal capacity would be expressed as the demand for capacity in addition to an amount equal to cargo movements. The magnitude of that additional amount would be a function of the institutional and economic factors described above as influencing the use of the region's port facilities.

SUPPLY OF CAPACITY FOR HANDLING CARGO

For identifying shortfalls, the supply of cargo-handling capacity is measured as the capacity of active Bay Area marine terminal facilities which currently exist or which are soon to be ready for operation. The capacity estimates in Chapter II (Table 4) for the existing and planned, publicly utilized terminals can be used as the estimates of supply in those cases where the publicly utilized facilities handle most of the cargoes of a

particular type moving through the Bay Area, as is the case for container/LASH/RORO and nonpetroleum liquid bulk. The supply of capacity handling break-bulk and dry bulk cargoes is more appropriately estimated as the sum of the capacity estimates for the existing and planned, publicly utilized facilities from Chapter II and the capacity estimates for active, non-publicly utilized facilities which are handling significant amounts of these cargoes.

For example, in the case of break-bulk, the present supply estimate to be used in identifying shortfalls would include capacity in 12 active Bay Area military and proprietary berths: one in Richmond, four in the Oakland Army Terminal, and seven in Naval Supply facilities in Oakland and Alameda. Estimated at 85,000 short tons per berth (Table 3), these berths would add approximately 1.02 million short tons per year of capacity to the present estimates for the publicly utilized facilities. For dry bulk, the current capacity in publicly utilized facilities is quite small relative to the cargo being handled, since much of this cargo moves through proprietary facilities (such as C&H Sugar in Crockett). Thus, for the purpose of estimating shortfalls, a present capacity estimate for all dry bulk facilities in the region, such as that developed by the Corps of Engineers (In-depth Study) is a more appropriate estimate than the estimate from Chapter II. Their present estimate shows 6.47 million short tons per year.

The supply of capacity used for estimating shortfalls is the practical capacity of marine terminal facilities. As described in detail in Chapter II, the practical capacity estimates are based on the technological, economic and institutional setting appropriate for the time periods for which the estimates are made. Specifically, the estimates in Chapter II which identify the present practical capacity of publicly utilized facilities within the Bay region take into consideration the facilities and equipment presently available at a terminal, the institutional

and administrative structure of the industry, the methods of operation of a terminal, vessel operating practices, and the nature of cargo and ships being handled at a terminal. The evolutionary process by which practical capacity of existing facilities may change over time (either increasing or decreasing) as a result of changes in these factors, has not yet been assessed. While the present estimates are certainly defensible through 1980, it may be desirable to assess the possibility for change over the more distant time periods.

CONSIDERATIONS REGARDING THE ESTIMATES OF SHORTFALL

As described in Figure 5, shortfalls in capacity to handle forecast cargo are estimated by subtracting the capacity supply estimates from the capacity demand estimates.

There are two considerations which should be kept in mind when reviewing the estimates of shortfall developed in this manner. The first concerns the possibility that there may be some shift in mode among the different types of facilities handling dry cargoes. Although such shifts are unlikely to significantly affect the estimates of shortfall, it should be noted that some interchange is likely to continue to take place. For example: containerizable cargo may move through break-bulk terminals and break-bulk cargo may move in LASH or RORO vessels. In addition, bulk commodities may move on LASH barges or break-bulk vessels, particularly if these movements occur in relatively small amounts. Such a situation would influence the estimates of shortfall, although somewhat temporarily, since these commodities would move as dry bulk cargo as soon as their volume increased to make it economical to do so.

The second consideration has to do with the effect on conclusions regarding shortfalls of individual bulk facilities (dry bulk or liquid) which are commodity-oriented and/or direction-oriented. For example, edible liquids may not be handled at liquid bulk facilities handling toxic chemicals and facilities to unload commodities may not be useful for loading functions. Thus, conclusions regarding shortfalls of bulk facilities should be qualified in that they do not take into consideration the demand for or the existence of specialized facilities of these types which must be considered on a case-by-case basis.

WAYS OF INCREASING EXISTING REGIONAL CAPACITY TO HANDLE SHORTFALLS

Having identified shortfalls, there are several ways that the throughput capacity of Bay Area terminals can be increased:

- by conversion of existing nonactively used or obsolete facilities;
- by expansion, modification or redevelopment of presently active facilities; and
- by construction of new facilities.

The extent to which capacity can and should increase by each of these means is the subject of the present regional port planning project. The process of considering how capacity could be increased was begun in this Phase I effort and is summarized in Chapter V. Additional concerns regarding this question, as well as consideration of the question of if, how and where capacity "should be" provided in the future, will be the subjects of subsequent phases of this project.

CHAPTER V

POTENTIAL OF BAY SHORELINE SITES FOR FUTURE MARINE TERMINAL USE

This chapter addresses the question of where potential exists to handle future shortfalls in port capacity. The following three research tasks were performed to answer this question: the selection of sites with potential for port use; the evaluation of the suitability of sites for port use; and the estimation of the potential capacity of each site. The purpose of these tasks was to develop an inventory and preliminary evaluation of all sites that could potentially accommodate port facilities. It should be noted that those sites identified as having the potential for port use may not necessarily all be feasible or practical to develop for port use. While rankings of many site attributes were developed, the relative importance of each attribute must be determined and additional information regarding feasibility should be developed before overall rankings can be made of the suitability of the sites for accommodating the different types of port facilities.

SITE SELECTION

Criteria

The specific criteria used to identify those San Francisco Bay shoreline sites having the potential for port use are shown in Table 9. These criteria provided a standardized, objective basis for deciding which shoreline sites have the potential for port use and, thus, should be inventoried and evaluated in this planning effort, and which ones should be excluded from further consideration.

Table 9

Site Selection Criteria Used to Identify San Francisco Bay Shoreline Sites Having the Potential for Port Use

A. Suitability of the Physical Geography:

A site was identified as having the potential for port use if it met the following conditions:

1. the site shoreline was within one-quarter mile of the 30-foot bathymetric contour;

   and

2. the site was not on an island that lacked road or rail access to the mainland.

B. Dedication to Other Uses:

A site identified above was deleted from the list of potential sites if it was currently in any of the following uses:

1. national, state, regional or local park or recreation area;
2. national wildlife refuge; or
3. actively used bulk petroleum facility.

For the purpose of this study, a depth of 30 feet was identified as the minimum necessary for port facility operation, although vessels designed to carry certain types of cargoes may require greater depths. A distance of one-quarter mile was determined to be a reasonable estimate of the maximum feasible distance from the 30-foot depth to the shoreline for port facility development, although dredging costs are not necessarily proportionate to the distance that must be dredged. Road and rail access were considered necessary for port facility operation, although where such access did not currently exist, judgment was exercised to estimate the likelihood that access could be created during the planning period.

Dedication to park, recreation or wildlife refuge use was considered a permanent status that would preclude port facility development. Since this study did not deal with bulk petroleum, such facilities were also considered as a use which would preclude port facility development.

Sites Selected

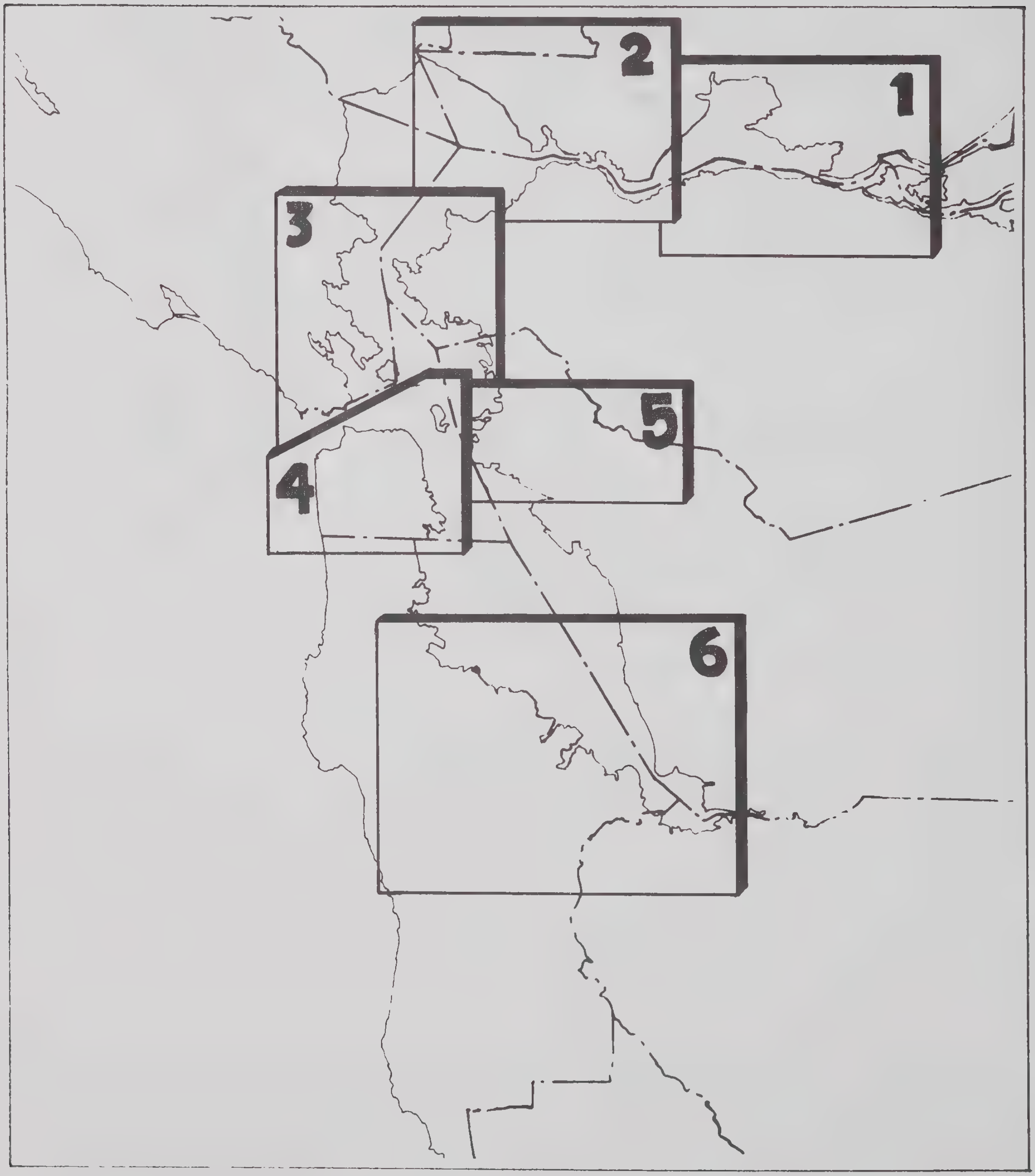
The maps following Figure 7 identify all of the sites in the San Francisco Bay Area* which met the criteria and show their area (letter) and site (number) designations. The maps also identify shoreline areas which are within one-quarter mile of the 30-foot bathymetric contour, but which were deleted from the list of potential port sites because they are presently dedicated to park and recreation uses, are national

*For this project, San Francisco Bay was defined as the four interconnected bays of South San Francisco Bay, Central San Francisco Bay, San Pablo Bay, and Suisun Bay; all areas subject to tidal action from the south end of South San Francisco Bay to the Golden Gate, to the eastern end of Suisun Bay (Grizzly Bay and Honker Bay). In practice, we defined the eastern boundary of the study area to include the Contra Costa County shoreline to the Antioch Bridge and the Solano County shoreline to the extent of BCDC jurisdiction near Collinsville.

Figure 7

<u>San Francisco Bay Shoreline Sites</u>

Map Index



Key

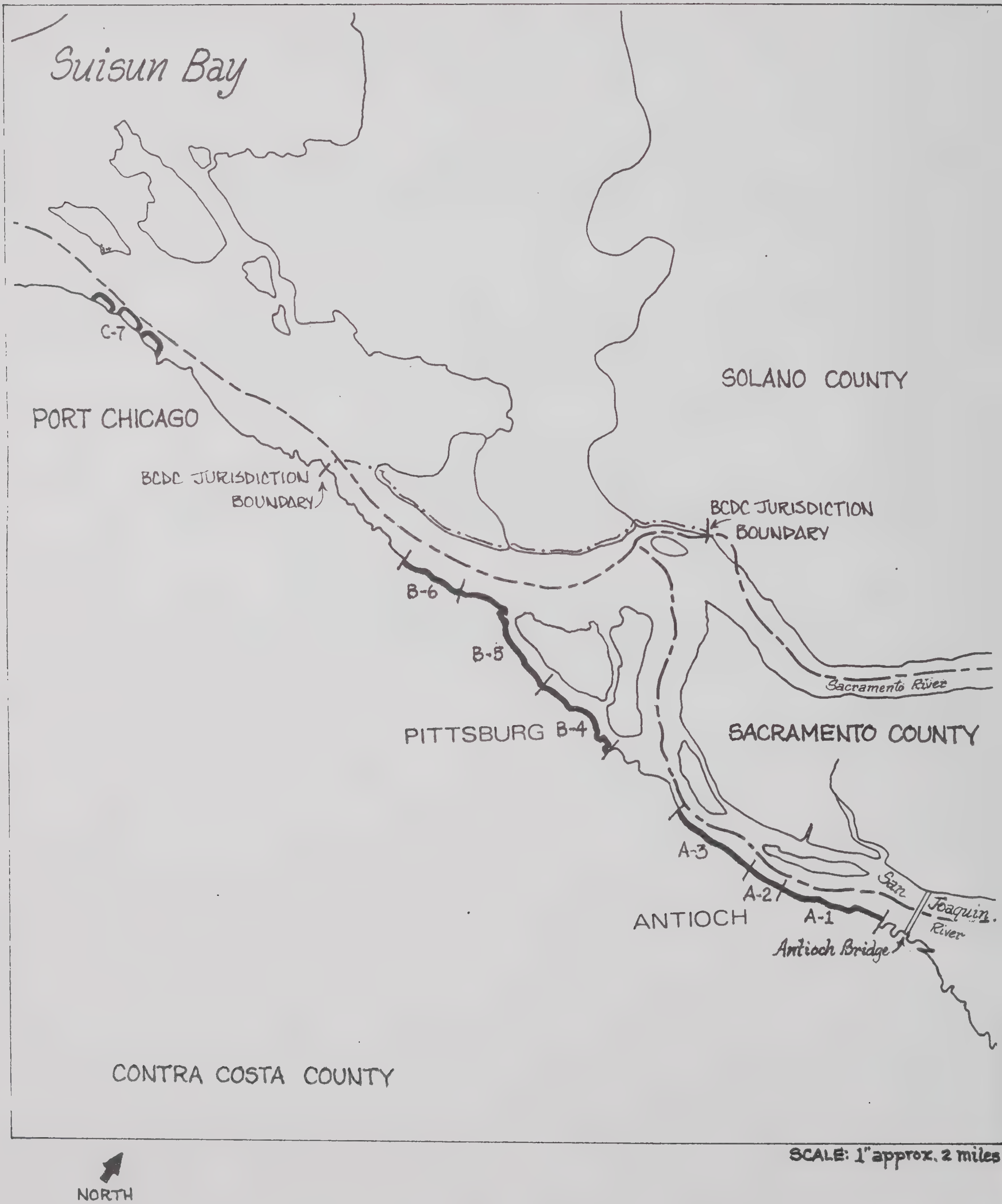
Bay shoreline sites meeting all of the site selection criteria. The area (letter) and site (number) designations are shown for each site considered for potential marine terminal uses in this study effort.

...... Bay shoreline areas within one-quarter mile of the 30-foot bathymetric contour but deleted from the list of potential port sites because they are presently dedicated to national, state, regional or local park and recreation uses or are national wildlife refuges.

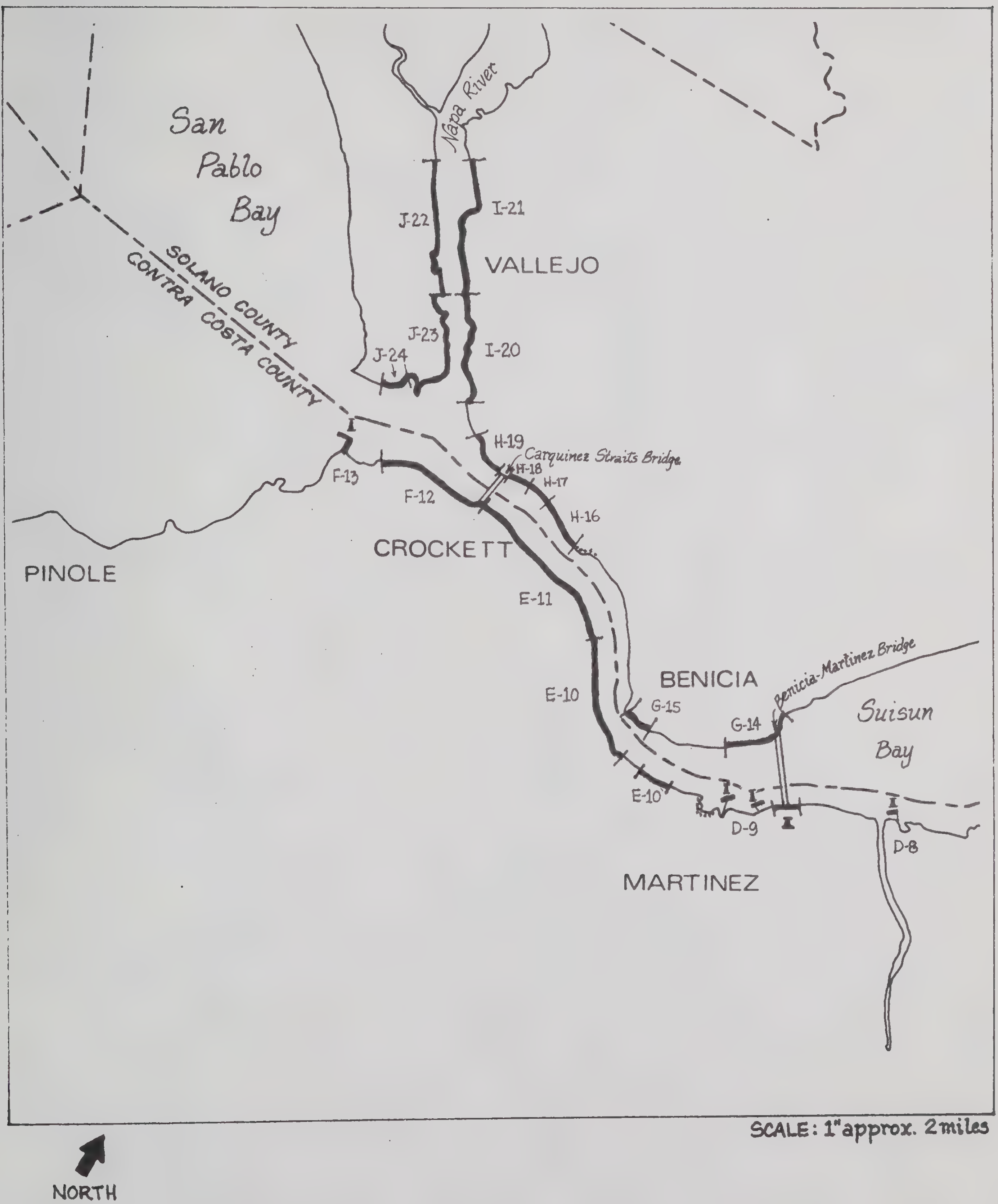
Bay shoreline areas within one-quarter mile of the 30-foot bathymetric contour but deleted from the list of potential port sites because the site is an island lacking road or rail access to the mainland.

Bay shoreline areas within one-quarter mile of the 30-foot bathymetric contour but deleted from the list of potential port sites because they are presently used for active, bulk petroleum facilities.

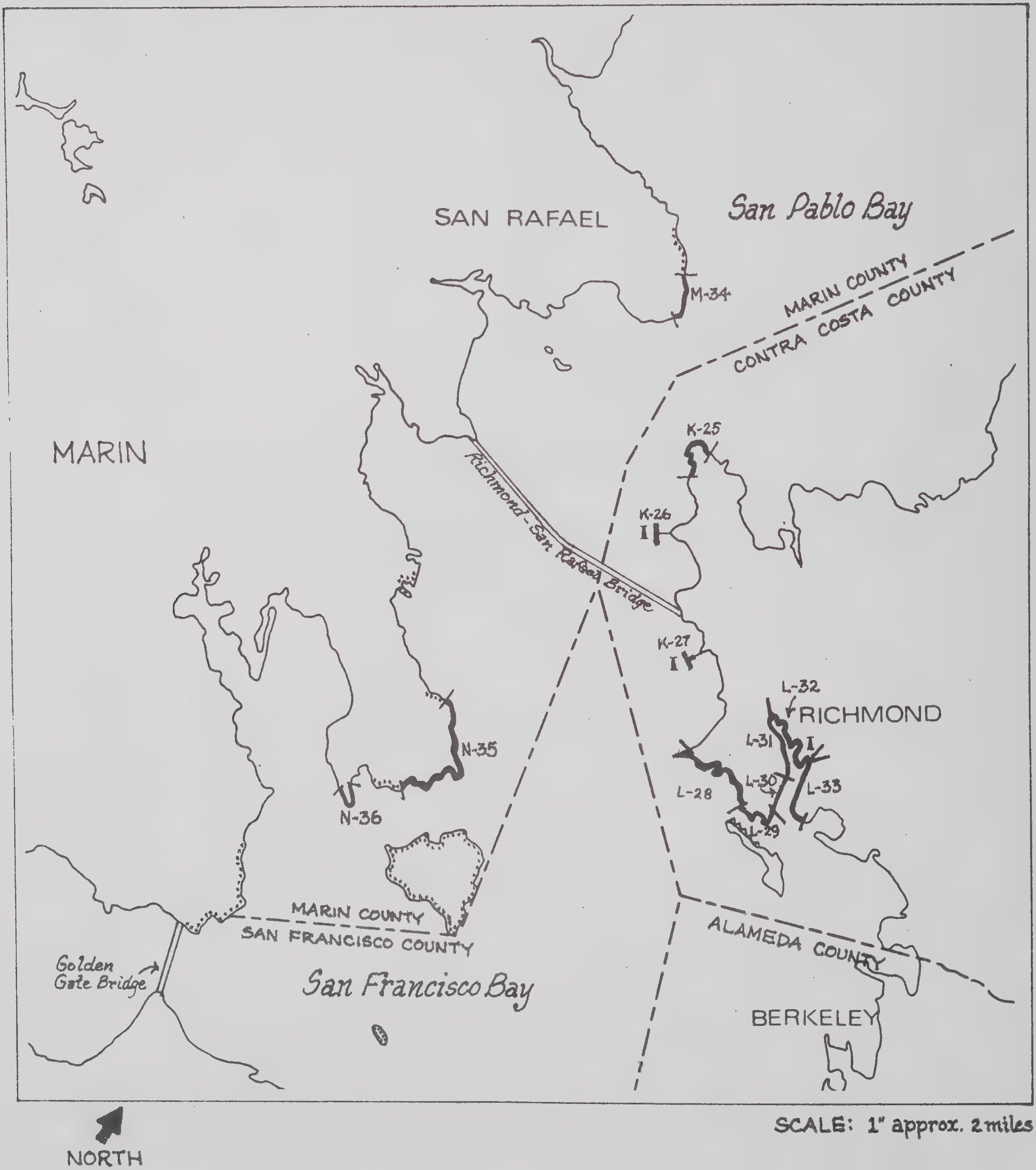
Map 1: NORTHEAST CONTRA COSTA



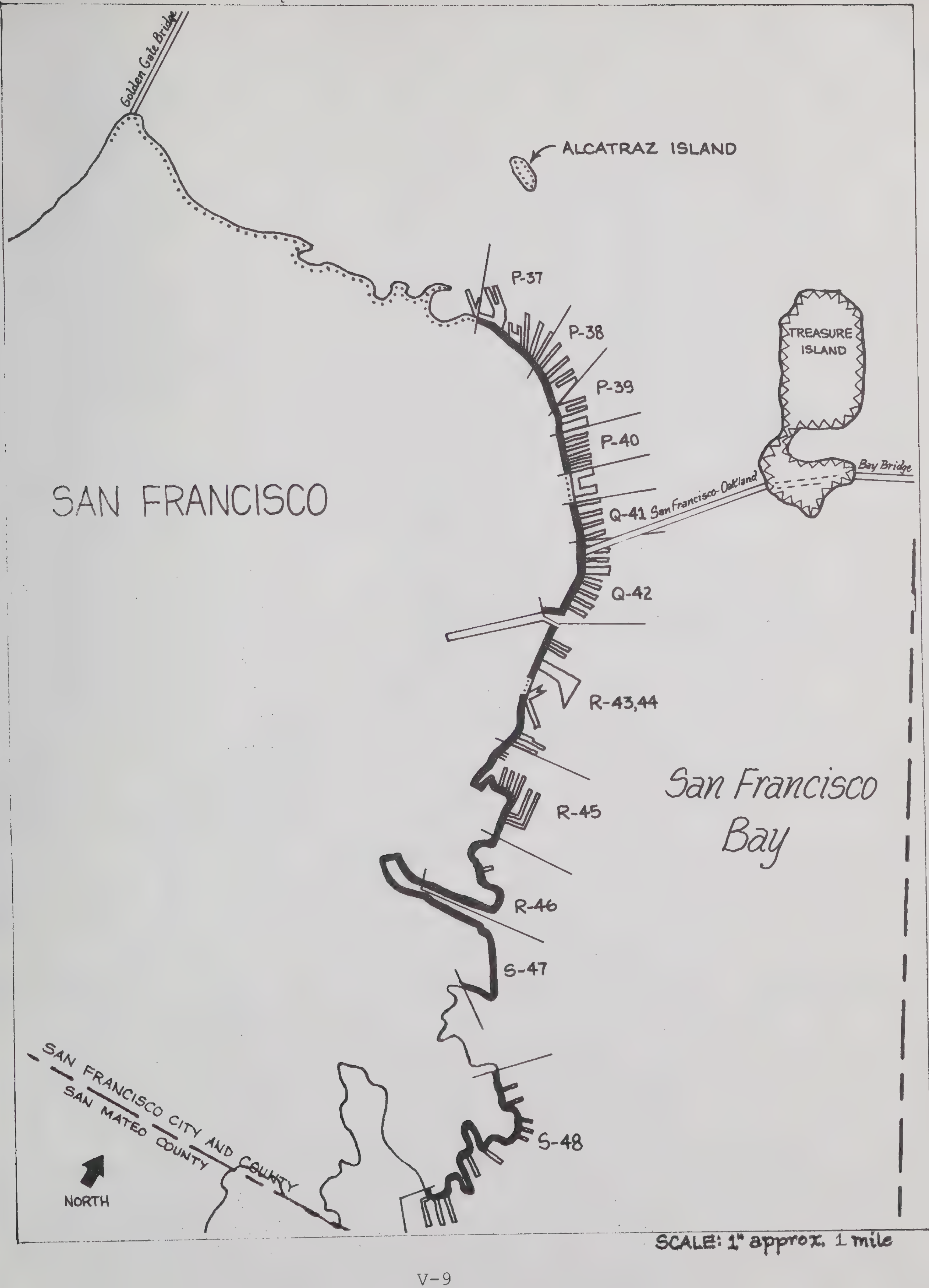
Map 2: NORTHWEST CONTRA COSTA, VALLEJO, AND BENICIA



MAP 3: RICHMOND AND MARIN

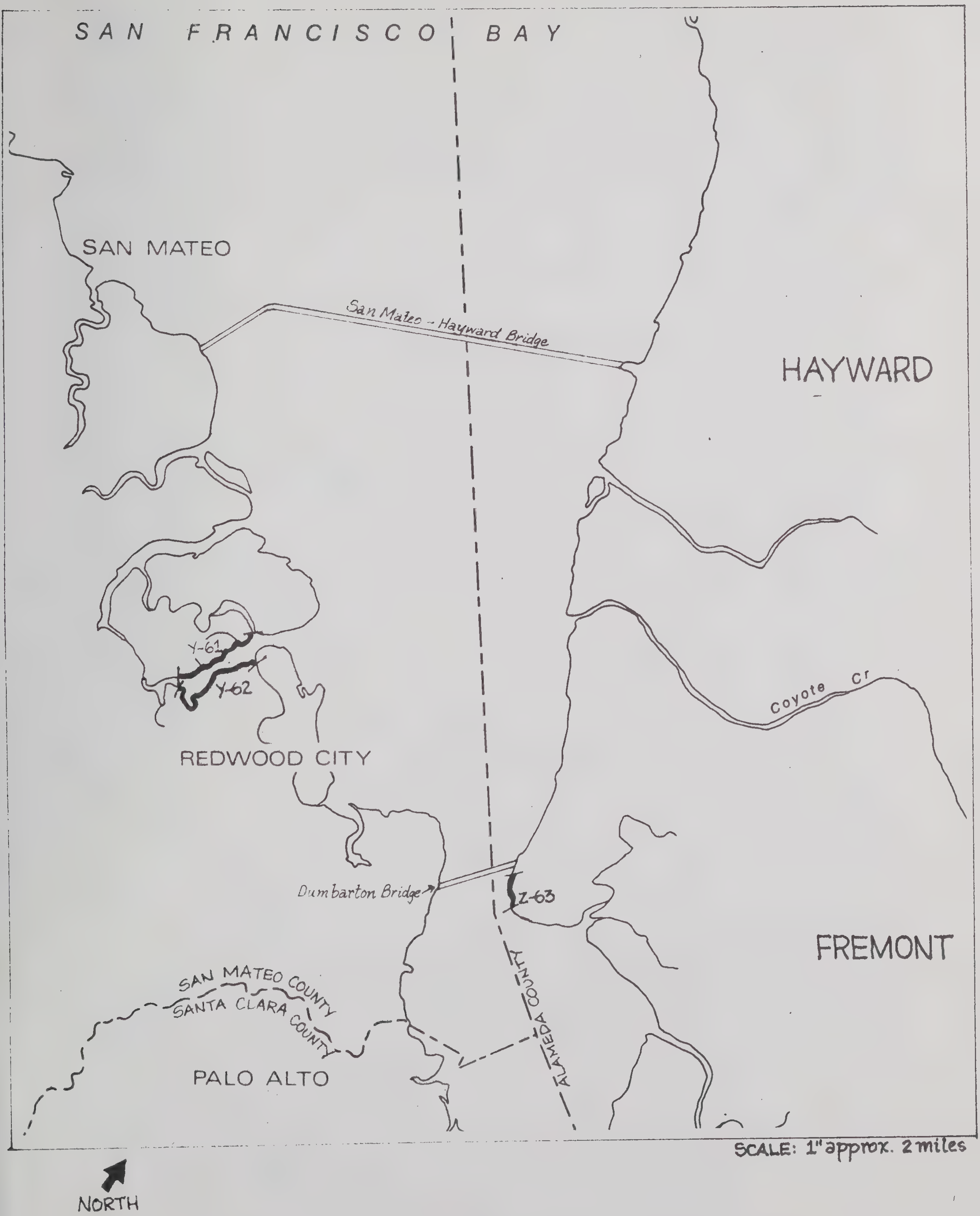


Map 4. SAN FRANCISCO



SCALE: 1" approx. 1 mile

Map 6: REDWOOD CITY AND DUMBARTON POINT



wildlife refuges, are on islands which lack road or rail access to the mainland, or are presently used for active, bulk petroleum facilities. A review of the sites selected with the use of the criteria indicates that all of the present port priority areas identified in the BCDC Bay Plan* have been included here as have all of the sites of currently active, publicly utilized port facilities.

SITE SUITABILITY

Potential Port Facility Configurations

In order to fully assess the suitability of a site for port facilities and to estimate the potential capacity of the site, it was necessary to design facility configurations for each site identified in the previous section. The goal of the design procedure was to maximize the capacity for handling the different types of cargo in relation to the physical and economic constraints on port facility development at each site.

Based upon a review of the physical characteristics of each site, the sites were divided into terminal areas. Configurations were then designed to handle the different cargo types. Where desirable, existing facilities were incorporated in one or more of the designs for each terminal. Thus the configurations included those which involved the expansion, modification, or redevelopment of existing facilities as well as those which would include the construction of completely new terminals. In designing the facility configurations, only freeways were considered infeasible to relocate and no land use conflict was considered to preclude port facility development. The practicality of relocating transportation corridors other than freeways, and the ability to gain access to the shoreline from existing transportation corridors, was evaluated on a site-by-site basis.

*Plan Map 2, San Francisco Bay Plan, San Francisco Bay Conservation and Development Commission.

Given the purpose of this work, as well as the time and resource allocations, the configurations drawn were those which appeared to be significantly different in terms of the evaluation of site suitability and the estimates of cargo throughput capacity. Further, the level of detail of the "design" was limited to that required to make the capacity estimates and the suitability evaluations. Thus, the configurations do not represent all possibilities and should be viewed as general concept designs of the types of terminals which could be built.

Criteria for Evaluating Site Suitability

Table 10 presents the criteria used to evaluate the suitability of the terminal areas (identified for the development of port facilities as described above) for handling the different types of cargo. The rankings of A through E were developed to relate differences in site characteristics to differences in the various types of costs and public approvals associated with developing or operating particular types of facilities on particular sites. In considering the attributes and developing the rankings for each, attention was given to the costs of development and operation that would affect the port operator involved and to the criteria in the BCDC San Francisco Bay Plan, the McAteer-Petris Act, and the MTC Regional Transportation Plan.*

Estimation of Potential Throughput Capacity

Estimates of the practical throughput capacity of sites having the potential for marine terminal use were completed using the methodology presented in Chapter II, by estimating the capacities for all of the potential port facility

*A description of each of the criteria in Table 10 identifying how each was used in the evaluation and what each one was designed to measure is provided in the working paper describing the site work in more detail, a copy of which is in Technical Appendix Volume B.

Table 10

Criteria for Evaluating the Suitability of Sites for Marine Terminal Uses

SITE ATTRIBUTE	Ranking Value A	B	C	D	E
Berth Length, ft.[1]					
Container/RORO/LASH facilities	$\geq$1000	800-999	700-799	600-699	<600
Break-bulk facilities	$\geq$ 700	600-699	500-599	400-499	<400
Neobulk facilities	$\geq$ 700	600-699	500-599	400-499	<400
Dry-bulk facilities	$\geq$1000	800-999	600-799	500-599	<500
Liquid-bulk facilities	$\geq$1000	800-999	600-799	500-599	<500
Gross Land Area, 000 Sq. Ft./Berth[1]					
Container/RORO/LASH facilities	$\geq$1500	1000-1499	500-999	250-499	<250
Break-bulk facilities	$\geq$ 75	50-74	25-49	15-24	< 15
Neobulk facilities	$\geq$ 500	250-499	150-249	100-149	<100
Dry-bulk facilities	$\geq$ 150	100-149	50-99	25-49	< 25
Liquid-bulk facilities	$\geq$ 200	150-199	100-149	50-99	< 50
Land Availability					
Percentage of site not in public port use,%	0	1-25	26-50	51-75	76-100
Current use of land not in public port use[3]	N/A[2]	undeveloped, military port, proprietary port	industrial, local streets, non-port military, marinas	commercial, mixed industrial/commercial	residential, major arterial, freeways, RR mainlines

The numerical values defining the ranking categories for berth length were based on a review of trends in ship lengths by type. Those for gross land area were based on characteristics of existing Bay Area port facilities with the "C" ranking identifying the average situation.

Signifies all land currently in port use.

If the physical condition of structures on the site is such that there is extensive new construction or extensively delapidated, abandoned or vacant structures, a note or remark describing the situation was included on the evaluation worksheet.

Table 10 (cont'd.)

SITE ATTRIBUTE	A	B	C	D	E
Development Requirements	None	N/A	moderate construction	N/A	extensive construction
Fill Parameters, 000 Sq. Ft. Surface Area	0	1-250	251-500	501-750	>750
Relationship of Facility Configuration to Marshes	not adjacent	N/A	adjacent to marsh	N/A	facility extends into marsh
Dredging Parameters					
Existing average depth at finished shoreline[4], in feet					
Container/RORO/LASH facilities	≥35	25-34	15-24	5-14	<5
Break-bulk facilities	≥35	25-34	15-24	5-14	<5
Neobulk facilities	≥35	25-34	15-24	5-14	<5
Dry-bulk facilities	≥40	35-39	20-34	5-19	<5
Liquid-bulk facilities	≥40	35-39	20-34	5-19	<5
Distance to 36-foot contour from finished shoreline[4], ft.	0	1-400	401-800	801-1300	>1300
Maintenance dredging requirements[5]	San Francisco, Carquinez Straits South, Pittsburg, Antioch, Marin	N/A	Oakland, Alameda, Richmond, Redwood City	N/A	Mare Island, Pt.Richmond, Carquinez Straits North
Arterial Connections, mi.	0[6]	.1-1.0	1.1-2.0	2.1-4.0	>4

[4] Finished shoreline is the shoreline after development which would include any fill or pier construction.
[5] A judgmental assessment of the magnitude of necessary maintenance dredging by area based on data supplied by the Corps of Engineers
[6] In-site or at edge of site.

Table 10 (cont'd.)

SITE ATTRIBUTE	A	B	C	D	E
Rail Connections, mi.[7]					
Container/RORO/LASH facilities	0[6]	.1-1.0	1.1-3.0	3.1-5.0	>5
Break-bulk facilities	0[6]	.1-.5	.6-1.5	1.6-3.0	>3
Neobulk facilities	0[6]	.1-.5	.6-1.0	1.1-2.0	>2
Dry-bulk facilities	0[6]	.1-.25	.3-.5	.6-1.0	>1
Liquid-bulk	0[6]	.1-.25	.3-.5	.6-1.0	>1
Relative Operating Efficiency[8]	-	-	-	-	-

[6] In-site or at edge of site
[7] Straight line distance
[8] Strictly a judgmental evaluation of the operating efficiency of the terminal. Principal considerations were traffic congestion and transportation distances within the terminal

configurations designed for each terminal area. These estimates add to the information base for evaluating site suitability and for considering where future shortfalls in terminal capacity could be satisfied. Since there were several configurations designed for handling the different cargo types at each site, there are many different ways of summarizing the capacity estimates depending upon the relative importance given to the different attributes evaluated. Further, additional information regarding the feasibility of the alternatives is desirable before overall rankings of the suitability of sites can be made. Thus, totals which could be provided as to the increase in Bay Area cargo handling capacity are not yet conclusive. As a result, a summary of the capacity estimates has not been included in this final report. The information developed in this Phase I effort is presented in detail in Technical Appendix Volume B.

SUMMARY OF THE SITE SUITABILITY EVALUATIONS

The evaluations completed using the criteria in Table 10 have been summarized on an area-by-area basis, identifying the significant characteristics constraining and/or encouraging port facility development. It should be recalled at this point that these evaluations were not meant to show which sites should be developed or which are necessarily the most feasible to develop.*

As a general comment for all of the areas discussed, it is likely that configurations of facilities on sites which are

*The worksheets for each area are included in Technical Appendix Volume B. It is this more detailed information which can be used to develop overall rankings of the suitability of Bay Area sites for accommodating the different types of port facilities.

presently within the jurisdiction of a public port authority could be developed in less time and possibly with more ease than those on sites outside of public port areas because the appropriate institutional structure already exists there and would not have to be created.

Northeast Contra Costa (Areas A, B, and C - Map 1)

Configurations were designed in this area utilizing land area that is generally in industrial use or that is undeveloped. An important characteristic of all sites in this area is that they currently are accessible only to ships of thirty feet or less draft.* Since there are few existing port facilities, development requirements for new facilities are almost always extensive. Fill requirements for configurations vary but are generally moderate, although initial dredging requirements are significant in many cases. A few sets of configurations are adjacent to a marsh area and in one case, the configurations extend into the marsh. Arterial connections are always within two miles but are frequently more than one mile while rail connections are generally closer. There are few conditions that operate to constrain the relative operating efficiency of the configurations designed.

Northwest Contra Costa (Areas D, E, and F - Map 2)

The most important constraint on port use of the sites in this area is that the land area available for terminal use is

*While depths in the adjacent channel sometimes exceed 30 feet, access to these areas is limited by the 30-foot depth in the channel adjacent to Roe Island in Suisun Bay.

severely constrained by steeply rising hills found a short distance from the shoreline. This land area constraint primarily impacts the potential for container/LASH/RORO facilities. Configurations designed in this area use land areas that are either undeveloped or in industrial use and since there are few existing port facilities development requirements are nearly always extensive. Fill requirements again vary but are generally moderate since it is not practical to undertake extensive filling because of the depth of water encountered at relatively short distances from the shoreline. No marshes are impacted by the configurations designed. Distances to arterial connections range from one to three miles, generally closer to the latter, while rail connections are always on site. There are few other constraints that affect the relative efficiency of the configurations designed.

Benicia (Area G - Map 2)

There are only two sets of terminal configurations in this area, one in the present port area and one west of the port. The latter one, occupying site G-15, has been designated the site of the Benicia Marina which is now under construction. Configurations on this site generally conflict with the marshes. The other, larger site (G-14) is the current site of the Port of Benicia operating facilities. Although this site lends itself readily to expansion of port facilities to accommodate current usage of dry and liquid bulk and rolling stock, development requirements for container facilities would involve substantial fill. Maintenance dredging requirements would vary from minimal for most configurations of pier facilities to higher levels for other designs. Arterial connections are currently within one to three miles, but direct freeway access is scheduled for construction starting in the fall of 1977. Rail connections are on-site.

Vallejo (Areas H, I, and J - Map 2)

Port facility configurations were not considered for the portion of this area east of the Carquinez Straits Bridge due to its prohibitive, hilly terrain. Sites adjacent to the Bridge on the west are constrained by hills so that extensive filling must be done to assemble land areas large enough for port uses. Thus, most of the configurations designed occupy either the present military port area (Mare Island) or undeveloped land, although there are a few which use industrial sites. Development requirements are generally extensive except where existing military or industrial port facilities are suitable for use. However, the use of these existing facilities is constrained in many cases by insufficient access to backup land area or by operating procedures which are inefficient. Fill requirements vary considerably, but are generally moderate in these areas. Maintenance dredging requirements would be extensive. None of the configurations appear to be in the vicinity of marshs. Arterial access varies but is generally fair to good from the non-military sites and poor from the military sites, and rail access follows the same patterns except that the dichotomy is more extreme.

Richmond (Areas K and L - Map 3)

There are sites in both the Port of Richmond inner and outer harbor areas that were not considered for reconfiguration due to their present use by active petroleum facilities. Hilly terrain and insufficient land areas are major constraints in the outer harbor while hilly terrain and existing non-port land uses are the major constraints in the inner harbor area. The presence of existing port facilities suitable for use keep development

requirements moderate in some cases, although they are extensive for most configurations because of the terrain. Fill requirements are generally moderate to small. None of the configurations appear to impact marshs. Maintenance dredging requirements are generally less substantial in the outer harbor area. Arterial connections are generally poor in the outer harbor and good in the inner harbor while rail connections are close in both areas. It was usually possible to design terminal configurations that can be operated relatively efficiently.

Marin (Areas M and N - Map 3)

The development of port facilities in this area is clearly constrained by both the hills rising almost immediately from the shoreline and the fact that most of the configurations designed would displace or heavily impact residential land uses. Because of the terrain, the configurations designed either have only moderate land area or extensive fill requirements. Development requirements are extensive in all cases. Initial and maintenance dredging requirements are minimal. Arterial and rail connections are both very poor and the relative operating efficiency of the configurations designed is generally mediocre.

San Francisco (Areas P, Q, R, and S - Map 4)

The major constraint to port development or redevelopment in much of this area is that other land uses must be displaced to obtain adequate sized land areas or that moderate-to-large areas must be filled to create these land requirements. Land use conflicts are generally more severe or constraining in the northern

portion of the area than in the south. Existing port facilities can likely be modified in many cases so that development requirements are often light to moderate. Both initial and maintenance dredging requirements are minimal. Arterial connections are good, although distances are generally shorter in the northern areas than in those to the south. Rail connections are almost always on-site. It is usually possible to design terminal configurations that can be operated relatively efficiently. The desire to avoid land use conflicts and/or to use existing port facilities were the two factors that usually constrained operating efficiency for some of the configurations designed.

Oakland (Areas U and V - Map 5)

Most configurations in this area would make use of military port facilities or industrial land uses, while only a few conflict with commercial or residential land uses or transportation corridors. In many cases existing port facilities can continue to be used or can be modified so that development requirements are often minimal. Substantial fill is sometimes required to obtain the large land areas desired. Initial dredging requirements tend to be light, while maintenance dredging requirements are moderate. Arterial connections are generally moderately close, although less so in the northwest. Rail connections are almost always on-site. The relative operating efficiency of terminal configurations designed varies widely because the shoreline is irregular in some places necessitating design of irregularly shaped configurations.

Alameda (Areas W and X - Map 5)

Over half of the sites in this area are on land now used by the military. In the non-military sections the configurations

designed would displace everything from proprietary port facilities to residences and commercial land uses. Development requirements tend to be moderate to extensive in the military section and vary even more in the non-military section depending on whether existing facilities are suitable for reuse. Both fill and initial dredging requirements tend to be minor in most cases although for a few configurations they are extensive. Arterial connections are fairly good in the non-military section and fair for the military side. Rail connections follow the same pattern, usually being on-site in the non-military areas but being quite distant at some points in the military section. It was usually possible to design configurations that could be operated relatively efficiently.

Redwood City (Area Y - Map 6)

The major constraints to the development of port facilities in this area are channel depth which limits access to the area to ships of thirty feet or less draft, the marsh impacts of many of the configurations designed, and the generally fair-to-poor rail and road access to parts of the area. On the other hand, there are no severe land use conflicts as most of the configurations designed occupy undeveloped, industrial or present port sites. Both fill and initial dredging requirements are generally moderate to small. Development requirements, however, are generally extensive. Sufficient land areas are available and generally not so irregularly shaped as to prohibit the designing of relatively efficient configurations in this area.

Dumbarton Point (Area Z - Map 6)

This area can only accommodate one terminal which would occupy presently undeveloped land and would require extensive development. A moderate amount of fill and considerable initial dredging are also required. Further, there is the potential of impact on the nearby marsh. Both arterial and rail connections are faily close to the site because of its proximity to the Dumbarton Bridges. It was possible to design a configuration that could be operated relatively efficiently, although the area's isolation and relatively small size make it a relatively less desirable location for public port use.

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EXHIBIT A

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SPNED-PN

Mr. Paul C. Watt, Executive Director
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Berkeley, California 94705

Dear Mr. Watt:

This letter is in response to an MTC request for comments from members of the MTC Regional Seaport Policy Committee on the Phase I Report of the Regional Port Planning Project. We have participated in the ongoing review of the Phase I contractor's progress and, in general, feel that the report will be helpful in subsequent Phase II and Phase III planning.

Of especial interest to us are the waterborne commerce forecasts and capacity factors that appear in the report and which have been adopted by the Committee. These figures are different from those developed by us in our somewhat paralleling investigation, the San Francisco Bay Area In-Depth Study. However, since the adopted capacity figures are close to ours and the range of commerce forecasts overlaps our forecast range, we see no need for strict numerical consistency at this time. We will continue to work closely at both the Committee and staff level to assure compatibility between our planning efforts.

On 1 September 1977 I assumed command of the San Francisco District, succeeding Colonel Henry A. Flertzheim and I will serve as the Corps representative on the Regional Seaport Policy Committee. Messrs. Hugh Converse and Robert Reynolds will continue as 1st and 2nd alternates, respectively.

Sincerely yours,

John M. Adsit

JOHN M. ADSIT
Colonel, CE
District Engineer

The Northern California
Ports and Terminals Bureau, Inc.

66 JACK LONDON SQUARE • OAKLAND 94607 • (415) 444-3188

September 16, 1977

Mr. Paul C. Watt, Executive Director
Metropolitan Transportation Commission
Hotel Claremont
Berkeley, California 94705

Attention: Mr. Dennis R. Fay

Dear Sir:

This letter constitutes a reply to your August 17, 1977 memorandum regarding the Phase I Report of the Regional Port Planning Project. This reply is made by the Northern California Ports and Terminals Bureau, Inc. (NORCAL) on behalf of its members on the Seaport Policy Committee representing Encinal Terminals and the Ports of Benicia, Oakland, Richmond, and San Francisco.

Before commenting on the specifics of the Consultant's report, we would like to outline our understanding of the procedures to be followed in organizing the public transmittal of the Phase I Report. We understand that a formal Committee Report will be prepared by the MTC staff for adoption by the Policy Committee. We further understand that the Consultant's report and the comments received from committee members, including this NORCAL reply, will be appended to the Committee report. In addition, we expect that the draft of the Committee report will be made available for review by Committee members prior to formal publication. We hope to work with you closely during this process.

As reported to your staff previously, we agree essentially with the capacities and projections shown in Chapters II and III. We have indicated some reservations about the figures shown in Table 3, particularly in the berth capacity for Container/LASH/RORO facilities; however, we have agreed that they should be used for the purposes of this report.

The shortfall concept discussed in Chapter IV presumes that the planning for additional terminals can be determined precisely on a regional basis by refining forecasts of capacity demand and capacity supply. Preliminary estimates of the effects of the refinements that will lead to such shortfall calculations for three factors are shown. Consideration of the first of these, military cargo movements, can only be expected to confuse rather than clarify planning figures; estimates of future military requirements depend on national defense policy decisions and

projections that would be reflected in reports that are highly classified. The uncertainties in these matters will create even more difficulties in ascertaining what future demands will be than exist with those shown in Chapter III. These cargo demands should be left out of future studies.

Seasonal fluctuations and incremental development patterns are considered in planning for terminals by the individual ports. However, the analysis of quantitative measures of these factors shown in Chapter IV lacks sufficient information for accurate estimates of them. In fact, it is not certain that considerable effort in future studies will provide any results other than a broad range of multipliers.

Comments on Chapter V have been furnished in previous correspondence (letters dated May 18 and June 27, 1977 from the Port of Oakland). The choice of Site Selection Criteria shown in Table 9 does not represent a balanced approach to site suitability. In particular the 1/4-mile distance from the 30-foot bathymetric contour unnecessarily rules out some potential sites, while no criteria were established for distances from ground transportation facilities. NORCAL does not agree that these arbitrary numbers provide a realistic basis for selecting potential port sites. Instead the criteria should be established based on developing sites that can be justified on an overall analysis of the economic and environmental factors involved. This approach would probably eliminate some of those included in Maps 1 - 6.

It is our understanding that the staff has agreed to consider additional sites by expanding the list of 63 to include the North Harbor in Oakland; others may be suggested as well.

It is also our understanding that a revision of the summary description of the Port of Benicia has been agreed upon.

We wish to continue to work with your agency to insure that the viability of the Bay Area Maritime industry is assured.

Sincerely,

Thomas R. Eddy,
President

STATE OF CALIFORNIA

EDMUND G. BROWN JR., Governor

SAN FRANCISCO BAY CONSERVATION AND DEVELOPMENT COMMISSION
30 VAN NESS AVENUE
SAN FRANCISCO, CALIFORNIA 94102
PHONE: 557-3686

October 18, 1977

On October 6, 1977, following a public hearing, the San Francisco Bay Conservation and Development Commission accepted Phase I of the Regional Seaport Plan with the following comments:

A. Existing Port Capacity: The port capacities established in the Phase One report appear to be reasonable. They are accepted by NORCAL, have been approved earlier by the Seaport Committee, and establish a sound basis for estimating future facility capacities.

B. Waterborne Commerce Forecasts: The projections in the consultants' report are based on several sources, and are acceptable. The use of a range of projections for planning purposes will not adversely prejudice future phases of planning.

C. Identifying Future Needs: The Phase One report goes considerably further than most other seaport planning to date in analyzing the method for establishing port facility needs. This analysis will be useful in identifying port needs during parts two and three of the Seaport Committee's work. The efficiency and technology questions in particular will be of interest to BCDC in evaluating the need for new fill for port expansion.

D. Potential Port Sites: The site identification and evaluation criteria are generally appropriate and will provide a solid basis for more detailed site impact studies as part of Phase Two. In addition, the criteria should also include the provision for the ports to nominate specific sites which, in their professional judgements, should be evaluated for possible port development.

E. Future Planning: The first phase study provides the basis for further regional seaport planning. Future work will include impact analysis of potential port development at various alternative sites, estimation of port facility needs into the future, and investigation of various means for increasing the efficiency of the regional port system. These elements of a regional seaport plan should give the Commission a solid basis for updating the Bay Plan port policies, and for evaluating future port-related permits.

MB/sl